Tampere University of Applied Sciences

Providing Assistive Technology to Students with Disabilities

A Review of Policies and Best Practices in Bangladesh

Oscar Antonio Boije

MASTER'S THESIS
May 2023

Master of Business Administration
Educational Leadership

ABSTRACT

Tampereen ammattikorkeakoulu
Tampere University of Applied Sciences
Master of Business Administration in Educational Leadership

BOIJE, OSCAR ANTONIO:
Providing Assistive Technology to Students with Disabilities: A Review of Policies and Best Practices in Bangladesh

Master's thesis 79 pages, appendices 14 pages
May 2023

Children with disabilities in Bangladesh face significant obstacles in terms of accessing and participating in primary education to the same extent as their peers, including due to a lack of access to assistive technology. This has led to the group being significantly over-represented among out-of-school children. In addition, those children that do participate in education struggled to acquire foundational literacy and numeracy skills and risk dropping out of school.

The thesis seeks to contribute to the Bangladesh Directorate of Primary Education’s and UNICEF’s planned pilot to enhance the provision of assistive technology to students with disabilities through the primary education system. Through a review of secondary data (academic literature, national legislation and policies, international treaties, thematic frameworks, and project reports), the thesis identifies how authorities in Bangladesh and other countries are presently providing assistive technology to children with disabilities, as well as how such efforts compare to globally established best practices developed by United Nations agencies and other international stakeholders.

Following a review of present policies and practices in Bangladesh, in particular the Policy on the Provision of Assistive Devices, and comparing them with global best practices, the thesis makes 15 recommendations aimed at enhancing further the present assistive technology provision process through primary schools in Bangladesh. The recommendations relate to Adjusting the Used Terminology; Engaging Teachers; Providing Additional Capacity Building Opportunities; Reaching the Children in Most Need of Support; Enhancing the AT Provision Cycle; Evaluating the Present DPE Process; and Reaching Out-of-School Children. Most importantly, education authorities in Bangladesh are recommended to adjust their current policies and practices to ensure the provision of assistive technology is treated as a holistic, long-term service.

Adopting the proposed recommendations, education authorities and other stakeholders in Bangladesh could enhance their inclusive education practices, consequently also ensuring more children with disabilities are able to access and participate in education.

Key words: primary education, assistive technology, children, disabilities, policies, best practices, Bangladesh

Assistive technology, a magical tool,
For children with disabilities, it can be so cool.
A world of possibilities at their fingertips,
Their abilities and talents now fully equipped.

Communication devices to help them speak,
Mobility aids so they can move and seek.
Adaptive equipment to make learning fun,
Assistive technology, a game changer for everyone.

With equal access to this technology,
Children with disabilities can truly be,
Active participants in every way,
In school, at home, and at play.

So let's ensure they have what they need,
To reach their potential and succeed.
Assistive technology, a bridge to inclusion,
A powerful tool for a more equitable solution.

(ChatGPT, 2023.)

CONTENTS

ABBREVIATIONS AND TERMS

ADs	Assistive Devices
APs	Assistive Products
APL	Priority Assistive Products List
AT	Assistive Technology
BBS	Bangladesh Bureau of Statistics
BDT	Bangladeshi Taka
CCs	Community Clinics
CDCs	Child Development Centers
CRC	Convention on the Rights of the Child
CRPD	Convention on the Rights of Persons with Disabilities
DPE	Directorate of Primary Education
GoB	Government of Bangladesh
ICF	International Classification of Functioning, Disability and Health
IEM	Inclusive Education Module
ISO	International Organization for Standardization
MCF	Module on Child Functioning
MCF-TV	Module on Child Functioning-Teacher Version
MICS	Multiple Indicator Cluster Survey
MoPME	Ministry of Primary and Mass Education
MoSW	Ministry of Social Welfare
NGO	Non-Governmental Organization
NSPD	National Survey on Persons with Disabilities
OHCHR	Office of the High Commissioner for Human Rights
OECD	Organisation for Economic Co-operation and Development
OPD	Organization of Persons with Disabilities
RPPD	Rights and Protection of Persons with Disabilities Act
PEDP4	Fourth Primary Education Development Programme
PHC	Population and Housing Census
SDG	Sustainable Development Goals
SEND	Special Education Needs and Disability Framework

SLIP	School Level Improvement Plan
SMC	School Management Committee
TAMK	Tampere University of Applied Sciences
UDHR	Universal Declaration of Human Rights
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children’s Fund
UNGA	United Nations General Assembly
UNSDCF	United Nations Sustainable Development Cooperation Framework
USD	United States Dollar
WG	Washington Group on Disability Statistics
WHO	World Health Organization

1 INTRODUCTION

1.1 Background

The number of persons living with one or more disabilities in Bangladesh is presently unknown, and the estimations have varied widely due to differing research methodologies used by different studies and surveys. The latest Population and Housing Census (PHC) from 2022 estimated the disability prevalence among the total population to be 1.44 percent (Bangladesh Bureau of Statistics [BBS], 2022b, p. 18). The preliminary report of the 2021 National Survey on Persons with Disabilities (NSPD), which was conducted by the same Government of Bangladesh (GoB) entity (the BBS) concluded though on the other hand that the prevalence was 2.8, i.e. double that of the PHC, with the prevalence among children aged 5-17 being 1.99 percent (BBS, 2022a, p. 19). On the other hand, the World Health Organization (WHO) assessed in its Global Report on Disability that the disability prevalence among the adult population (18 years and older) in Bangladesh was 31.9 percent in 2011 (WHO and World Bank, 2011, p. 271). In that report WHO did not attempt at estimating the prevalence of disabilities among children in Bangladesh.

While the prevalence of disabilities among Bangladeshi children is presumably not as high as the WHO study reports, it is likely higher than what the 2022 PHC and the 2021 NSPD concluded (Directorate of Primary Education of Bangladesh [DPE], 2020, p. 118). The 2019 Multiple Indicator Cluster Survey (MICS) estimated that 7.3 percent of children aged 2-17 lived with functional difficulties in at least one domain (BBS and United Nations Children’s Fund [UNICEF], 2019, p. 375). The National Survey on Children’s Education in Bangladesh 2021 – which was also conducted based on the MICS methodology – found on the other hand that 4.2 percent of children aged 5-17 lived with functional difficulties in at least one domain (BBS and UNICEF, 2022). Both these surveys used the Washington Group on Disability Statistics (WG) questionnaire which is considered a global standard for disability and functional difficulty identification, and their results are therefore comparable with other national and international surveys using the same methodology (BBS and UNICEF, 2019, p. 68).

Disregarding which study is used to estimate the prevalence of disabilities or functional difficulties among children in Bangladesh, it is evident that these groups face significant obstacles in accessing and participating in primary education to the same extent as their peers. The latest Annual Primary School Census (APSC) from 2021 reported that 99,961 children with disabilities were enrolled in primary education (DPE, 2022a, p. 74). Considering the total primary education population of 16,964,967 students, children with disabilities represented less than 0.6 percent of all students (DPE, 2022a, p. 67). Despite the number of children with disabilities presently enrolled in primary school in Bangladesh is extremely low, it still represents a significant improvement compared to the figures reported earlier years (Dr. Ahsan *et al.*, 2019, p. 51). In addition to the challenges related to enrolment, a 2021 study that assessed the impact of the COVID-19 pandemic found that children with disabilities struggled to acquire foundational literacy and numeracy skills, consequently scoring significantly lower in standardized assessments compared to other peers (BBS and UNICEF, 2022, p. 19).

It is therefore evident that, despite the GoB having developed and adopted various bills and policies which have reinforced the right to inclusive education (among others, the Primary Education (Compulsory) Act, 1990; the National Policy on Disability, 1995; the Persons with Disability Welfare Act, 2001; the National Education Policy, 2010; the Children Act, 2013; the Rights and Protection of Persons with Disabilities Act, 2013; the Protection of Persons with Neuro-Developmental Disability Trust Act, 2013; the draft National Education Act, 2016; Fourth Primary Education Development Program, 2018) their implementation has still not led to equal access and participation in primary education for all children in Bangladesh (Choudhury *et al.*, 2011, p. 19). The country is not alone in this shortcoming though, with similar trends being evident in most countries around the world (United Nations Educational Scientific and Cultural Organization [UNESCO], 2020, p. 10).

The lack of dedicated, individual, and streamlined support is likely the most significant cause for children with disabilities in Bangladesh and other countries not being able to access and participate in education. With education being a prerequisite for a dignified life, not presently having equal access to primary education is therefore not only a violation of these children’s universal right to education but also a violation of a broader set of their human rights (McCowan, 2013, p. 51).

1.2 Thesis Objective

Among the various challenges and barriers children with disabilities face to access and participate in education, DPE – the implementing agency for primary education under the Ministry of Primary and Mass Education (MoPME) of Bangladesh – and UNICEF have recently agreed to jointly address the fact that a significant proportion of children with disabilities lack such assistive technology (AT) that would enable them to fully participate in education as well as in society at large on an equal footing with other peers (MoPME and UNICEF, 2022). For this purpose, DPE and UNICEF have agreed to conduct a pilot on the streamlined procurement and distribution of AT to primary school students with disabilities, to test how a DPE-led model could be designed and work in practice on a small scale, prior to potentially scaling it up across Bangladesh.

As a side note, it should be noted that the GoB uses in its official education policies and strategic documents mostly the term assistive devices (ADs) to describe what is in this thesis referred to as assistive products (APs), which in turn is one of the components of AT provision. Though the thesis prefers to use the term AP due to it being the more commonly used term in international contexts, including in the definitions by WHO and the International Organization for Standardization (ISO), the term should be understood to have the same meaning as the GoB’s definition of ADs. A more detailed discussion of what the terms AT and AP mean in practice, as well as how they are used in different contexts, is included in the Literature Review chapter.

The objective of this thesis is to support the design and implementation of the above-mentioned DPE-UNICEF pilot through an analysis of secondary data on similar support interventions in Bangladesh and other contexts, to reach a common understanding of key terms and processes, and to compile previously identified best practices and lessons learned which could also be of relevance for the presently planned pilot. The thesis analyzes therefore challenges and opportunities related to AT in the context of Bangladesh, among others looking into how schools are supporting the identification of children with disabilities in need of AT, and how AT is presently being procured and used within the education sector.

While the thesis hopes to inform the planned DPE and UNICEF Bangladesh pilot, the views expressed in this thesis are solely those of the author and do not necessarily represent the views of UNICEF, DPE, or any other entity.

1.3 Justification

The thesis was primarily written for UNICEF Bangladesh Country Office, to contribute to the design and implementation of the DPE-UNICEF pilot on the procurement and distribution of AT to primary education students with disabilities. Though the pilot will initially only engage a limited number of children with disabilities within a selected number of primary schools in Bangladesh, the impact could over the mid and long term be significant as DPE and UNICEF hope to scale up the initiative further in the future.

Through its contribution to the DPE-UNICEF pilot, the thesis will also contribute to DPE and the GoB achieving a number of national and global objectives, including such which have been set in the Fourth Primary Education Development Programme (PEDP4) (DPE, 2018), the Special Education Needs and Disability Framework (SEND) (DPE, 2022b), the Bangladesh – UNICEF Programme of Cooperation 2022-2026 (UNICEF, 2021a), the United Nations (UN) Sustainable Development Cooperation Framework (UNSDCF) 2022-2026 – Bangladesh (Ministry of Finance of Bangladesh and UN Bangladesh, 2021), and the UN Sustainable Development Goals (SDG), in particular SDG 4 on inclusive and equitable quality education for all (United Nations General Assembly [UNGA], 2015).

Finally, aside from Bangladesh, also other countries around the world are presently facing partially similar challenges related to in practice ensuring all children have equitable access to quality primary education. The findings of this thesis could therefore also be of relevance in other contexts and contribute to informing nascent or more developed education sector activities and interventions, especially in the areas of AT and inclusive education.

1.4 Research Questions

The thesis aims at supporting DPE and UNICEF to develop and implement a pilot on the streamlined procurement and provision of AT to children with disabilities in Bangladesh, to improve their access and possibilities to participate in primary education. Taking that into consideration, the main research question of the thesis is:

What are the best practices related to the procurement and distribution of assistive technology DPE and UNICEF in Bangladesh should take into consideration when developing its pilot for primary school students with disabilities?

In addition, to support answering the main research question, the thesis has also set the following three research sub-questions:

- SQ1: How is AT being procured and distributed to children and school students with disabilities in Bangladesh and other contexts at the moment?
- SQ2: What best practices and lessons learned on the procurement and distribution of AT to children and school students with disabilities have been generated by other stakeholders in the past in Bangladesh and other contexts?
- SQ3: How could the aforementioned best practices and lessons learned be utilized by UNICEF and DPE to enhance the design of their planned pilot?

The above-mentioned research question and sub-questions guided the entire thesis' research work, including the selection of secondary data to be analyzed and methodologies chosen for the analysis. In addition to being directly and indirectly responded to throughout the thesis, specific responses to each of them are included in the Conclusion chapter of the thesis.

1.5 Structure of the Thesis

Following the Introduction chapter, which sets the background and framework for the research work, the thesis describes in the second chapter the methodology approach used to collect and analyze data, as well as ethical considerations.

In the third chapter the thesis reviews available literature, splitting the content into two separate but interconnected areas, namely the education, policy, and legal context within which the DPE and UNICEF pilot is planned, and national as well as international experiences of procuring, distributing, and using AT in schools to support children with disabilities.

In the Discussion chapter, the thesis compares present practices in Bangladesh with best practices identified in other contexts and based on that, makes recommendations for the planned DPE-UNICEF pilot. Finally, in the last chapter, the thesis returns to the research questions, to review and summarize the findings as well as describe some of the study’s limitations.

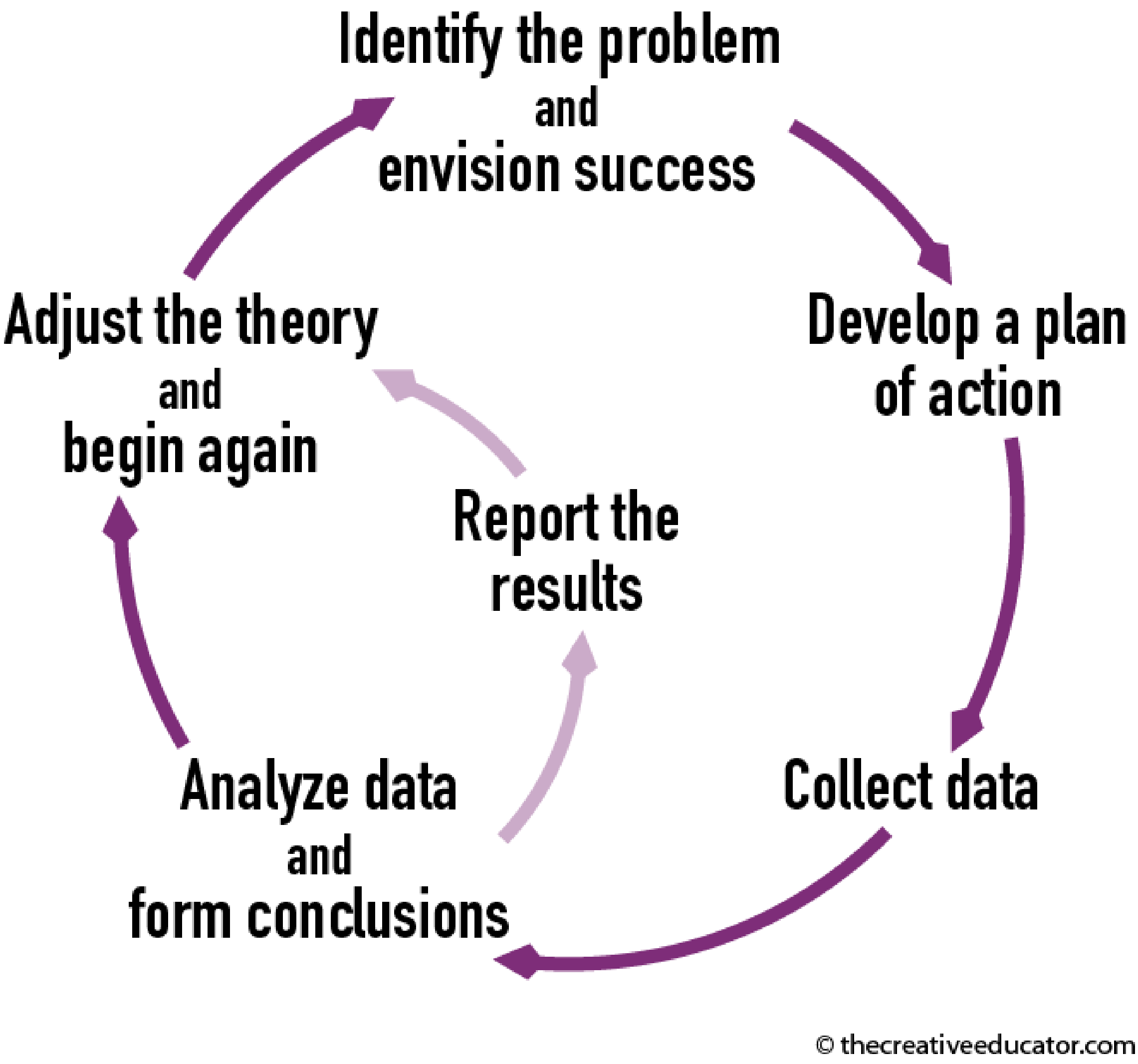
2 METHODOLOGY

2.1 Methodological Approach

The thesis utilizes foremost a combination of qualitative research and action research methodologies to address the research question and sub-questions, and to consequently propose practical recommendations that could be considered for adoption by DPE and UNICEF in Bangladesh.

Compared to quantitative research methodologies which primarily aim to draw conclusions based on the collection and analysis of measurable data (such as the number of children with disabilities enrolled in schools, the percentage of schools with accessible ramps, or the proportion of girls that lack access to AT), qualitative research focuses on trying to understand phenomena and aspects of social life that impact people, and describe it through words rather than numbers (Brikci and Green, 2007, p. 3). Qualitative research analyses and generates therefore primarily words, based on which conclusions can then be drawn and decisions made on potential follow-up actions. This thesis uses qualitative research methodologies as a limited amount of data is available on AT within the Bangladeshi education sector, and more importantly, a quantitative analysis would not satisfactorily respond to the thesis' research questions, hence not meeting the thesis' set objectives.

As the thesis aims at contributing to solving a practical challenge – enhancing the procurement and distribution processes of AT provided to primary education students with disabilities – the thesis uses qualitative research in combination with an action research methodology. Action research is often described as the use of various research methods to develop new solutions or improve existing processes (*Action Research*, 2015). While action research typically includes a number of pre-defined steps that form a repeatable *cycle of action* (see Picture 1 below) which includes, among others, the identification of the challenge, the collection and analysis of data, the reporting of the results, the development and testing of plans to tackle the challenge, the evaluation of results and adjusting of the theory, and the repetition of the process (*Action Research*, 2015), this thesis will limit itself to only reach the reporting of the results cycle step. Following that, the responsibility for the implementation, testing, and re-evaluation of the pilot (which requires financial, human, and other resources which go beyond the scope and capacity of this research work), will fall on DPE, UNICEF, and other education sector partners in Bangladesh.



PICTURE 1. The Action Research Cycle (*Embrace Action Research*, no date).

In practice the qualitative action research methodology used in this thesis focuses therefore on two key steps: Firstly, conducting a qualitative analysis of secondary data, among others through the review of academic literature, policies and frameworks, and other publicly available sources of data related to past experiences with the use, procurement, and distribution of AT in schools in Bangladesh and other contexts. The objective of this analysis was to set the framework for a common understanding of key terminology, concepts, and models, as well as to identify past experiences and lessons learned that contributed to shaping the practical recommendations the thesis made for the planned DPE-UNICEF pilot.

Secondly, by utilizing an action-oriented research methodology to draw practical conclusions from the findings of the qualitative secondary data analysis, the thesis proposed concrete recommendations which DPE and UNICEF could consider when developing and implementing the planned pilot. By doing so, the thesis makes a practical contribution to the DPE-UNICEF pilot, but also in general to the education sector in Bangladesh and beyond.

2.2 Ethics

Considering that the thesis relies almost entirely on publicly available secondary data, the work is for the most part free from the challenges related to the collection and presentation of primary data, including ensuring voluntary participation, informed consent, and, where relevant, confidentiality. The limited primary data used in this thesis almost exclusively consists of the author's own experiences, and to a lesser extent on data and information collected as part of formal and informal engagements with the education sector as well as some of its representatives in Bangladesh and other contexts over the last decade. When analyzing and including such ethnographic research data in the thesis, the author has ensured no personally identifiable data is included in the thesis report, and that any such personally identifiable data that was stored in any format (electronic or printed) as part of the research work, was permanently deleted after the completion of the research work.

Qualitative action research is by definition subjective to an author's own biases. While the author has made every effort possible to ensure the analysis of data is done in an as objective manner as possible, it has to be acknowledged that biases still influenced every step of the work, including the decisions on the data to be collected and included in the thesis, as well as the recommendations made as a consequence of the findings of the analysis. Such biases are not possible to avoid – neither when the author writes the thesis, nor when the reader assesses its relevance, accuracy, and quality.

2.3 Data Collection

The thesis uses primarily two secondary sources of data: Academic literature, and policies, frameworks, project reports, toolkits, and other relevant documents. In addition, but to a lesser extent, the thesis also uses the author's own ethnographic research data, foremost through self-reflective analysis of the primary data and information collected through professional experiences and interactions with relevant sector stakeholders in Bangladesh and other contexts.

The secondary data sources were primarily identified through searches made on the academic and other databases available through Tampere University of Applied Science's (TAMK) library services. In addition, but to a lesser extent, also publicly available search engines were used to identify relevant secondary data, including Google and Ecosia (Microsoft Bing). The key terms utilized included Assistive Technology, Assistive Devices, Disabilities, Children with Disabilities, Bangladesh, Schools, Education, Inclusive Education, Access to Education, Disability Screening, Disability Identification, Procurement, Distribution, Teacher Training, and Teacher Capacity Building. The key search terms were used both separately as well as through various combinations, and also diverse filtering was used to limit the number of results and identify the most relevant data sources possible. Such filtering included limiting the date of publication to only the past fifteen years and only considering resources available electronically through TAMK's library services.

While the author considered adopting a classical literature review methodology where all literature identified through defined search terms would have been analyzed and included in the research, it was clear that such a methodology would have come with its own set of limitations, including the fact that it would likely have placed a greater than desirable weight on quantitative research findings. The author opted therefore instead for a selective literature review methodology which better took into consideration the limited but at the same time diverse data and literature available related to Bangladesh on the topic of the thesis. While also this methodology has its own set of limitations, it was assessed that, compared to the classical literature review methodology, it suited better the overall objectives of the research work and therefore had also better opportunities at making relevant contributions to the education sector in Bangladesh.

2.4 Data Analysis

The thesis used foremost two methodologies for the analyses of the secondary data collected as part of the thesis research: Inductive thematic analysis and retrospective analysis.

Inductive thematic analysis relates to compiling and reading textual data (in the case of this thesis this meant academic literature, policies, frameworks, project reports, etc.) and identifying emerging themes based on which conclusions can try to be drawn on a certain topic. Retrospective analysis on the other hand aims at mapping trends, potentially even trying to predict the future, by assessing past conclusions reached by previous research. (Dr. Nel, 2020.)

The thesis used the two above-described approaches to, on the one hand, collect, analyze, and identify past experiences and trends related to inclusive education, especially concerning AT and children with disabilities (retrospective analysis), and on the other, categorize the findings based on the themes and topics that emerged from the literature review (inductive thematic analysis). While the methodologies were used flexibly, especially considering the diverse type of secondary data analyzed, they provided a clear framework for the analysis as well as the reporting of the thesis' findings.

3 LITERATURE REVIEW

3.1 Introduction

Every child, including children with disabilities, have the right to access and participate in education on an equal basis with other children. For that to take place in practice though, national education systems need to, among others, be inclusive, accessible, flexible, and provide appropriate accommodations and support to those children that require it. Such efforts are to a large extent not optional enhancements education authorities can choose to adopt, but they are rather legal obligations countries and their governments have committed to through international treaties and national legislation, and against which they can be held accountable for their actions (or lack thereof).

In this chapter, prior to diving deeper into the processes of procuring, distributing, and using assistive technology in schools, an analysis will be made of the legal and programmatic contexts within which children with disabilities participate in education in Bangladesh and globally. This includes discussing who the primary subjects of the thesis are, where the universal human right to education stems from, and how international and national policies and other legal instruments have been interpreted to also establish a universal right to inclusive education for children with disabilities. Understanding these legal and programmatic contexts is a pre-requisite to also understanding the practical efforts education systems around the world, including that of Bangladesh, have made to support children with disabilities to access and participate in inclusive education.

3.2 Programmatic Context

3.2.1 Children with Disabilities

The UN Convention on the Rights of the Child (CRC) defines a child as “every human being below the age of eighteen years” unless otherwise defined in national law (CRC, 1989, Article 1). As all except one of the UN’s member states have ratified the convention (Office of the High Commissioner for Human Rights [OHCHR], no date), the definition used in the CRC is widely considered to also be the universal definition of a child. Bangladesh has adopted national legislation that also uses a similar definition, namely that “all persons *up to the* age of 18 (eighteen) shall be considered children” (italics in original text) (Children Act, 2013, Chapter I, Article 4).

The Convention on the Rights of Persons with Disabilities (CRPD) does not make an attempt at defining who “persons with disabilities” are. Instead, the CRPD advocates for flexibility as disability is an “evolving concept” and a result of “the interaction between persons with impairments and attitudinal and environmental barriers that hinders their full and effective participation in society on an equal basis with others” (CRPD, 2006, Preamble, e). That interpretation of the interaction between a person with impairments and his/her environment (also known as the social model of disability) underlines hence that the socially constructed barriers in the environment are what disables individuals, rather than their impairments (*Social Model of Disability*, no date).

Although the CRPD does not provide a clear definition of the term persons with disabilities, it does give some hints as to who might belong to the group, stating that persons with disabilities can include those “who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others” (CRPD, 2006, Article 1). In addition, various countries have established through national legislation their own definitions of the term. Bangladesh is also one of them, having adopted the Rights and Protection of Persons with Disabilities Act (RPPD) which defines persons with disabilities as “any person who has a physical, sensory, mental, intellectual, or other impairment, including any visual, hearing, learning or physical incapacity, or any combination of such impairments, that substantially affects one or more of his or her major life activities, and creates a barrier to his or her full and effective participation in society” (RPPD, 2013, Section 2, j). While the RPPD does not explicitly use the social model of disability in its definition, it is clear the legislation uses elements of the model, as one of its stated aims is to address the barriers that prevent persons with disabilities from fully participating in society, among others, providing reasonable accommodations (RPPD, 2013, see e.g. Section 7).

Considering the aforementioned definitions/descriptions, the term “children with disabilities” could be defined as persons with disabilities who are below the age of eighteen years. As highlighted above, in the context of Bangladesh, the definition would rely on the respective definitions included in the Children Act, and the Rights and Protection of Persons with Disabilities Act, both from 2013 (Bangladesh National Assembly, 2013a, 2013c).

Finally, it should be mentioned that this thesis uses deliberately the term children with disabilities and inclusive education, and refrains from using “special needs” terms such as “children with special needs” or “special educational needs”. The special needs term is avoided considering that disability advocates correctly point out that all human beings have certain needs, and that the needs of persons with disabilities are not special, they are often simply different from those of others (Oliver, 2021). While the author refrains from using special needs terms, such terms have been included when discussing or quoting international or national policies and other documents that use the terms, including some of the policies of the GoB.

3.2.2 Right to Education

Though there are still challenges regarding its implementation, the right to education is a fundamental human right that has been enacted in both international treaties as well as national legislation across the world, and which every person is entitled to enjoy (Singh, 2010, p. 86). The UNGA’s non-binding Universal Declaration of Human Rights (UDHR) establishes that “Everyone has the right to education” (UDHR, 1948, Article 26). While the UDHR does not specifically mention age or disability among the statuses that are prohibited from being used to discriminate against individuals and consequently deny them their human rights (UDHR, 1948, Article 2), later international human rights treaties have specified that also these statuses are covered by human rights, hence clarifying that children with disabilities shall also enjoy the universal right to education without discrimination (see e.g. the CRC, 1989; the CRPD, 2006; and the World Declaration on Education for All and Framework for Action to Meet Basic Learning Needs, 1990).

The CRC reiterates that every child has the right to education, but also that children with disabilities shall be extended assistance (subject to available resources though) to ensure they have effective access to and receive education (CRC, 1989, Articles 1, 23.1 and 28.1). The CRPD expands on this, declaring that “States Parties shall take all necessary measures to ensure the full enjoyment by children with disabilities of all human rights and fundamental freedoms on an equal basis with other children”, hence prohibiting discrimination, and that recognizing the right of persons with disabilities to education, “States Parties shall ensure an inclusive education system at all levels” (CRPD, 2006, Articles 7 and 24).

In Bangladesh, free and compulsory education is a constitutional right every child should have the right to enjoy (Constitution of the People’s Republic of Bangladesh, 1972, Part II, Article 17, a). In addition, every citizen shall have access to all rights enshrined in the constitution, disregarding their “religion, race, caste, sex or place of birth” (Constitution of the People’s Republic of Bangladesh, 1972, Part III, Article 28, 1). Though the constitution does not explicitly refer to age or disability, it is clear that the last-mentioned non-discrimination clause has in later legislation and policies been interpreted to also include such statuses that ensure children with disabilities are not discriminated against (see e.g. the Primary Education (Compulsory) Act, 1990; the National Policy on Disability, 1995; the Persons with Disability Welfare Act, 2001; the National Education Policy, 2010; the Children Act, 2013; the RPPD, 2013; the Protection of Persons with Neuro-Developmental Disability Trust Act, 2013; the Draft National Education Act, 2016; the PEDP4, 2018).

Despite it being a universal right and the situation having improved over the past decades, not all children have yet in practice access to participate in education. UNESCO estimates that 258 million children aged 6-17 are not participating in any form of formal education (UNESCO Institute for Statistics (UIS), 2019, p. 1). The figure is likely to be even larger though as that estimate was made in 2019, prior to the outbreak of the COVID-19 pandemic and the school closures that impacted education sectors across the world. In the case of Bangladesh, a study conducted in 2021 to understand the impact the COVID-19 pandemic had on the education sector found that the rate of primary-aged children out of school almost tripled compared to 2019, increasing from 6.4 to over 15.4 percent (BBS and UNICEF, 2022).

Though it is challenging to determine the number of children with disabilities who are out of school globally, it is estimated that children with disabilities are in some contexts up to twice or three times more likely to be out of school compared to other peers (UNESCO Institute for Statistics (UIS), 2018, p. 3). In addition, children with disabilities are almost 50 percent more likely to have never attended school, and if they do, they are over 40 percent more likely to lack foundational reading and numeracy skills, as well as more likely to drop out of school compared to other children (see, among others, Male and Wodon, 2017; UNICEF, 2021b).

In Bangladesh, primary school-aged children with functional difficulties are almost twice as likely to be out of school (BBS and UNICEF, 2022, p. 24). By lower secondary, the likelihood of being out of school has increased to over two and a half times (BBS and UNICEF, 2022, p. 26). While about 50 and 26 percent of children without disabilities aged 7-14 demonstrate foundational reading and numeracy skills respectively (a poor rate already in itself), only about 39 and 18 percent of children with disabilities are able to demonstrate the same skills (BBS and UNICEF, 2022, pp. 46 and 53). Such study findings highlight the fact that children with disabilities in Bangladesh struggle to a greater extent within the education system compared to other children. Put in other words, the children are presently not being able to fully and equitably enjoy their universally as well as nationally recognized right to education.

3.2.3 Inclusive Education

In 1994, the Salamanca Statement on Principles, Policy and Practice in Special Needs Education called governments (including those that fund development programs), UN agencies, and Non-Governmental Organizations (NGOs) to move away from seclusive, separate education systems and schools for children with disabilities (Nilholm, 2021, p. 358), instead advocating for the inclusion of these children into “regular schools” (The Salamanca Statement and Framework for Action on Special Needs Education, 1994, Articles 2–4). While the Salamanca Statement dealt specifically with the inclusion of children with disabilities into the wider education sector, the concept of inclusive education developed in the Statement laid the foundation for what is today understood to encompass inclusive education.

There is however no universally accepted definition of inclusive education, and the term is still today understood differently around the world (Mahlo, 2016, 4). This diversity of interpretations, not only in the definition of the term, but also of how inclusive education should be achieved, is to some extent driven by diverse political agendas, but also due to the complexity of the concept itself (Mahlo, 2016, p. 4). While most agree about certain general characteristics – e.g. that inclusive education systems value diversity and should flexibly accommodate to meet every child’s unique characteristics, interests, abilities, and learning needs, and that by doing so all children of all backgrounds would have equitable access to quality education and learning in the same classrooms and schools (UNICEF, no date; UNESCO, 2013) – the finer details of the concept are very much still up for debate and interpretation.

Though inclusive education relates to a whole plenitude of diverse statuses, including language, ethnicity, socio-economic status, legal status within a specific context, gender, etc. this thesis will focus on inclusion from the point of view of children with disabilities. Inclusive education is of utmost importance for especially this group as it faces a number of physical, social, attitudinal, and other barriers which prevent them from participating in education on an equal basis as other children. While varied success has been achieved in different countries in relation to the practical implementation of inclusive education (Mahlo, 2016, p. 5), no country is yet to fully succeed in this aspect, in particular, because inclusive education is not a specific result, but rather a continuously ongoing process (UNESCO, 2020, p. 10).

Children with disabilities' universal right to inclusive education stems from an array of international treaties and frameworks, including the CRC and the CRPD (CRC, 1989, Articles 23 and 28; CRPD, 2006, Article 24). In Bangladesh, the National Education Policy does not explicitly mention inclusive education but many of its provisions are aligned with an inclusive education model. Among others, the policy sets as one of its objectives, to the extent possible, the mainstreaming of children with disabilities into regular schools, with only "acutely handicapped children who cannot fulfill the demands of daily life due to their physical or mental disabilities" being enrolled in special needs schools (National Education Policy, 2010, p. 43).

The above-mentioned has unfortunately though led in practice to the creation of two parallel education systems, with MoPME being responsible for the provision of primary education to children without disabilities, or with only mild or moderate disabilities, while the Ministry of Social Welfare (MoSW) is responsible for the education of children with severe disabilities (DPE, 2022b, p. 4). Considering that the MoSW's expertise does not lie in the field of education, the division is not optimal and most likely results in children with severe disabilities not accessing quality education to the same extent as their peers. No comparable data is available on the learning outcomes of the education the MoSW provides children with severe disabilities, nor is data available on the number or rate of children with severe disabilities that are outside of the education system altogether. Even within the education system managed by MoPME, the low enrolment rate of children with mild and moderate disabilities showcases that there still is significant room to enhance and intensify efforts to include more children with disabilities in the MoPME's managed "mainstream" education system.

Despite the above-mentioned shortcomings in the present set-up of the education system in Bangladesh and the consequences it has in terms of limiting all children with disabilities from equitably accessing quality education, the GoB is well aware of its responsibilities towards these children and is working towards ensuring the country's education system is progressively made more inclusive. In addition to the significant number of education policies that make direct or indirect reference to inclusive education (see e.g. the Children Act, 2013; the RPPD, 2013; and the Protection of Persons with Neuro-Developmental Disability Trust Act, 2013), the recent adoption of the Special Education Needs and Disability Framework (SEND), which will be accompanied by specific plans and strategies, is another clear example of the country's concrete policy commitments and practical actions toward inclusive education for children with disabilities.

3.3 Disability Screening and Identification

3.3.1 The Process of Identifying Disabilities

As Schuelka has described it, paradoxically, "promoting inclusive societies and inclusive education must first construct differences and marginalization between societal groups" (Schuelka, 2015, pp. 830–831). The labeling of children and categorizing them into different groups is consequently a necessary evil: A to some extent undesired exercise that is though expected to lead to better inclusion and equity. But that positive potential will only be capitalized in case the differentiation of the children leads to specific interventions that facilitate access to dedicated support (Braun, 2020, p. 10). In an ideal situation, the identification of AT does not hence only lead to the procurement and distribution of a certain AD, but, where relevant, also to e.g. the development of individualized educational plans that support the child in a holistic manner (Braun, 2020, p. 13).

The provision of AT to children with disabilities should therefore be based on verified and agreed-upon needs. Not every child with a disability necessarily requires AT, and if they do, the support might not be required in all contexts and situations. As was established earlier, disability is a social construct, and as such, also the barriers that impose the disability can in some cases be overcome without having to provide individuals with AT (*Social Model of Disability*, no date). Such adjustments include, e.g. modifying the physical environment, or how society and its members interact with the child.

Even before trying to identify the AT needs of children, an assessment needs to be made to establish their potential disabilities or other functioning difficulties, based on which AT needs can then be considered. Ideally, the identification of disabilities should be done as early as possible in order to facilitate early interventions and support, as relevant. The earlier an intervention takes place and support is provided, the likelier it is that a child can participate in society on an equal basis with other children. In societies with established healthcare services, many disabilities are often identified among children at an early stage, much before they enroll in school, and in some cases even before birth (Sonnander, 2000, p. 21). In case assessments are made in school contexts, these are usually conducted by professionals from the clinical fields of psychology or psychiatry, e.g. school psychologists, doctors, nurses, speech-language pathologists, social workers, or therapists (Braun, 2020, pp. 11–12). In such contexts, teachers usually play the role of referrers, with the psychology or psychiatry professionals making the assessments (Braun, 2020, pp. 12–13).

Parents also play a crucial role in the early identification of their children's potential disabilities (El-Hazmi, 1997, p. 159). For parents to be able to support this process though, to identify signs of disabilities based on which healthcare services can then conduct more detailed assessments to confirm or reject the suspicions, parents often need to be aware of how diverse disabilities manifest themselves in children. This in turn requires either experience or certain levels of general education, especially related to typical child development and milestones. That is especially the case for such disabilities that are more challenging to detect, such as e.g. intellectual or cognitive disabilities, but it could also relate to physical impairments that are not obvious to an untrained eye (El-Hazmi, 1997, p. 159).

In societies where most disabilities are assessed and identified at an early stage – initially through detecting potential signs at home and then verifying it through healthcare services – schools and healthcare services can consequently spend a greater amount of their efforts in at least two other areas, namely: 1) Providing practical support to the children that have been identified to have one or more disabilities, in terms of pedagogical as well as AT, as relevant, and 2) Screening children who have been assessed to be at risk of developing disabilities (Sonnander, 2000, p. 21). While the first activity is aimed at ensuring children with disabilities are able to participate in society to the same extent as their peers, the second aims at utilizing early interventions to potentially prevent the disabilities from developing. In addition, and especially related to providing practical support, authorities can, based on identified needs, take decisions on necessary resource allocations (Braun, 2020, p. 13), which can include human resources, material resources, including personal or school-based AT, and financial resources (Organisation for Economic Co-operation and Development [OECD], 2007, p. 19).

The above-described scenario with frequent screening, early detections, and close interactions with healthcare services is often though not the reality experienced by children and parents in societies with underdeveloped and fragmented healthcare services. The same can also be said of Bangladesh, which, despite having made progress in the past decades, still has a long way to go before all its citizens, especially those belonging to marginalized socio-economic groups that live in rural or urban slum areas, have equitable access to universal health coverage (Joarder, Chaudhury and Mannan, 2019, pp. 1–2). In such contexts, teachers might themselves therefore have the responsibility of conducting preliminary assessments and as such play a crucial role by contributing to the identification of children who might be living with disabilities and who could require and benefit from dedicated support, including AT. But to realize that opportunity, significant efforts are required by various stakeholders, especially education and healthcare authorities, including the teachers themselves (Braun, 2020, pp. 12–13).

Following the globally recognized and agreed importance of the topic over the past few decades, teachers all over the world are today being provided pre- and in-service training on inclusive education. The objective of this training is to, among others, raise teachers' awareness about inclusive education practices and provide them with knowledge and practical skills they can practically use in the classroom to better support children with diverse backgrounds. Most of these training sessions are though relatively short: thematic in-service training sessions are often just 4-5 days long, and do not necessarily only focus on inclusive education, but often allocate time to also other topics, such as gender, mental health, psycho-social support, etc., all of which are important but limit the amount of training time dedicated specifically to inclusion. As a consequence, teachers often end up feeling even more overwhelmed or stressed after the training than they were before, and that they are not sufficiently qualified to teach children with diverse disabilities (see, among others, Talmor, Reiter and Feigin, 2005, p. 226; Gray, Wilcox and Nordstokke, 2017, p. 205; Allam and Martin, 2021, p. 47). This can, among others, relate to the fact that they after the training are sensitized and better aware of all their additional responsibilities, but not necessarily on how to in practice being able to ensure the education in their classroom is inclusive, considering the various resources limitations they face, especially time but also human (Gray, Wilcox and Nordstokke, 2017, p. 205).

The training of teachers is often also rather theoretical and does not necessarily reflect the reality within which the teachers are expected to implement inclusive education practices (Better Purpose, 2023, 19:35). This leaves many teachers feeling that the training they receive is insufficient to actually being able to support children with disabilities within their classrooms, let alone assisting other authorities and stakeholders in the preliminary identification of disabilities among their students (see, among others, Taweechaisupapong, 2015; Kuroda, Kartika and Yuto, 2017; Warnes, Done and Knowler, 2021). This sentiment – that teachers lack sufficient training to effectively deliver inclusive education – is also common among parents (Valjakka *et al.*, 2022, p. 16), who consequently might question the value of investing their often limited financial and other resources into their children’s education (persons with disabilities and their families often live in greater poverty than other groups in society) (see, among others, Mitra, Posarac and Vick, 2011, pp. 61–62). Finally, and maybe most important for this thesis, the pre- and in-service training organized for teachers on inclusive education, rarely touches upon or provides them with practical tools to assist them in the preliminary screening of (signs of) disabilities among their students. This is due to a lack of, among others, resources, understanding of the potential benefits of engaging teachers in the preliminary assessment of students, and standardized national or localized policies which would define how teachers should conduct such preliminary assessments. There have been though attempts at addressing the last-mentioned shortcomings by international institutions, as well as in certain specific countries.

In Bangladesh, teachers do not officially participate in the preliminary screening or identification of disabilities among students. NGOs have in some locations established initiatives through which older primary students conduct basic screenings of younger peers (e.g. assessing sight and height-weight). These initiatives are though mostly awareness-raising and social-behavioral change activities, and the findings of the screenings do not necessarily result in clear support for the students found to potentially require it. To identify children who could benefit from AT, a medical doctor from a local health center should screen and prepare a list of all children with disabilities, according to DPE's Policy on Assistive Devices (DPE, 2016). The disability screening and certification process is not detailed in the policy, nor the criteria which should be utilized to prioritize the children that should benefit from AT (other than mentioning that it should be done based on disability severity level and type) should there not be sufficient resources to support all, most likely is the majority of cases. It has overall been suggested that the monitoring of multi-disciplinary services in schools still requires further efforts, especially on the effective implemented of the afore-mentioned policy in schools (Grimes and dela Cruz, 2021, pp. 52–53).

Outside of schools, GoB-led disability identification services have expanded significantly over the past decades: The GoB has invested heavily in the health care sector, among others establishing new Child Development Centers (CDCs) and over 13,000 Community Clinics (CCs) in especially rural areas (see, among others, Khan et al., 2018; Mehrin et al., 2020). Both CDCs and CCs contribute to the early identification of children with disabilities through multi-disciplinary teams of health workers that include child health physicians, child psychologists, developmental therapists, community health care providers, health assistants, and family welfare assistants (Khan *et al.*, 2018; Mehrin *et al.*, 2020). These professionals are provided with specialized training in the screening and identification of disabilities among children. Despite these improvements, especially rural communities have been reported to not being able to access the services to the same extent as urban communities (Dr Grimes *et al.*, 2022, p. 15).

The process of identifying disabilities among children, especially in rural and remote locations, relies therefore still to a large extent on the work of NGOs and Organizations of Persons with Disabilities (OPDs) such as the Bangladesh Protibondhi Foundation (BPF), the Centre for the Rehabilitation of the Paralyzed (CRP), BRAC, and the Disabled Rehabilitation and Research Association (DRRA) (Dr Grimes *et al.*, 2022, p. 15). Some of these NGOs and OPDs, in collaboration with international NGOs such as Plan International and Humanity & Inclusion, have implemented inclusive education projects in Bangladesh over the past decade, among others distributing AT to children with disabilities. While the projects expectedly encountered certain challenges, such as the high cost of deploying multi-disciplinary teams to rural and remote schools, or the schools' and authorities' high reliability on project teams for the completion of activities, most of these challenges were overcome and the projects were able to propose recommendations and ways forward for the sustainable expansion of inclusive education across the country (Dr. Ahsan *et al.*, 2019, pp. ii–iii).

Assessing the present status of inclusive education, and in particular AT provision through schools, it is at the same time though rather clear that the above-mentioned NGO and OPD-led projects did not lead to desired mid- and long-term, system- and sector-wide changes (Dr. Ahsan *et al.*, 2019, pp. iii–iv). There are various reasons for this, including the fact that DPE, MoPME, and other authorities were not given sufficient ownership of the initiatives, consequently also not having after the projects ended the technical or administrative capacity to take over the responsibilities for the established AT services. In addition, the education sector lacks sufficient resources, which constraints the extent to which students with disabilities can be provided AT and other types of support. It has therefore been challenging for DPE, MoPME, and the education sector in general to take advantage of the knowledge and experience generated by these past NGO and OPD-led projects, especially as the secondary data analysis for this thesis found that the documentation of the processes and results of the activities has not been optimal, with project reports accurately evaluating results but not describing in sufficient detail the methodologies and tools used which would allow for other stakeholders to later continue the started work. This has in practice likely led to a loss of institutional as well as programmatic memory as at least part of the stakeholders engaged in the NGO and DPE-led projects have after the projects ended shifted their focus towards other activities, taking with them the lessons learned and knowledge generated.

As also the examples in the next section will showcase related to the use of preliminary screening frameworks in schools, unless policymakers are engaged and included in the setting up (mandatory) sustainable and long-term system-wide solutions, initiatives are likely to remain sporadic, only covering a limited geographical area, and only targeting a part of the whole school student population, hence further exacerbating inequalities.

3.3.2 Disability and Functioning Screening Frameworks

Some of the most used frameworks and tools developed on an international level do not attempt to specifically identify disabilities but are rather used to understand these individuals' levels of functioning and consequently also the challenges they potentially face when interacting with surrounding environments. These tools are used especially in censuses and similar types of surveys (in particular in low- and middle-income countries), in contexts where there is a need to estimate the prevalence of disabilities, but where the individuals participating in the surveys often lack official certification of their disabilities and/or the enumerators collecting the data are not trained nor qualified to determine disabilities among the population. Based on (mostly self-)assessments of individuals' functioning, estimations can then be made on the challenges these persons experience, including the potential disabilities they live with. The most common frameworks assessing functioning include the WHO's International Classification of Functioning, Disability and Health (ICF), the WG and UNICEF's Module on Child Functioning (MCF), and the OECD's Classification of Special Education Needs (OECD, 2004; ICF, 2021; WG and UNICEF, 2022).

The MCF – included as Appendix 2 – is of particular interest to this thesis as it was developed specifically for children, based on the most relevant categories and domains identified in the ICF (WG and UNICEF, 2017, p. 4). The two available MCF modules are designed for children aged 2-4 years and 5–17 years, respectively, and collect data on the functioning challenges children experience (mostly as reported by their parents or guardians) on a scale from 1 to 4 representing: No difficulty; Some difficulty; A lot of difficulty; Cannot do at all (WG and UNICEF, 2022). The questions (24 in total) are worded using simple but specific enough language to ensure both the persons responding to the questions as well as those collecting the data fully understand their meaning. In addition, separate instructional guides have been developed for enumerators and those analyzing the data collected, to support them in the interpretation of the data (WG and UNICEF, 2017, p. 6). The MCF is the standard tool used in MICS surveys and has also served as a model for authorities around the world when developing their own, national or sub-national frameworks in contexts where access to official disability certification or data is not available.

Acknowledging though that the MCF might not always be suitable as such for use in school settings, WG and UNICEF have also initiated the development of a Teacher Version of the MCF (MCF-TV). Though a draft version of this new module is available upon request for piloting purposes and has indeed already been used in some challenging contexts including in emergencies and crises, it is still officially under development and not available for use as more evidence is still required on the challenges and opportunities of the tool (*Informational Meeting on Experiences with the Child Functioning Module-Teacher Version*, 2021). While it was not possible to acquire a copy of the draft MCF-TV as part of the literature review for this thesis, it would be highly relevant for DPE and UNICEF to consider requesting access to the tool should it be decided that the DPE-UNICEF pilot should also engage teachers in the preliminary screening of functioning challenges among students.

It should also be mentioned that, in addition to the MCF and draft MCF-TV, the WG and UNICEF have also been working on developing an Inclusive Education Module (IEM) to specifically be used in and around school settings to identify the enablers and barriers to school participation. Complementing the MCF, which focuses on individuals, the IEM focuses on both physical as well as socio-economic environments, providing authorities and schools with a practical tool to assess the accessibility of school infrastructure, which in turn can have a direct impact on e.g. AT needs. In addition, the IEM also assesses the factors that prevent children with disabilities from enrolling in school, as well as push them to drop out of school. Though the IEM has already been tested in a few countries, it is still to be finalized, including the out-of-school section. Once ready, the IEM will likely be as crucial to the identification of barriers to children with disabilities' education, as the MCF has been so far in supporting the identification of children with functioning challenges. (*WG/UNICEF Inclusive Education Module (IEM)*, no date.)

Considering that the MCF-TV and IEM are not yet available, a number of countries have in the meantime developed and adopted their own preliminary disability and functioning screening frameworks and tools to be utilized by teachers in school settings.

Prior to the development of a national checklist, only 8 of India’s 29 states had tools for teachers to conduct a preliminary screening of disabilities among students, each with separate sets of questions and modalities of reporting. At the same time, studies found that about half of all state education authorities had difficulties or were confused about the characteristics or symptoms of some disabilities they were supposed to be screening for. The Ministry of Education of India developed and launched therefore in 2022 Prashast – a practical tool for teachers and school staff to conduct a preliminary screening of disabilities among their students. The checklist contains two parts: Part 1 for regular teachers, and Part 2 for special educators or counselors to validate the teachers’ assessments. School heads can also complete Part 2 if no special educators or counselors are available. Based on the results of the preliminary screening, school staff can facilitate the referral of students for further diagnosis. As highlighted several times in the tool’s manual, Prashast is not a diagnostic tool, and should not result in the needless labeling of students; it is only meant for preliminary screening and referral. (Department of School Education and Literacy, 2022, pp. 1–3.)

The two Prashast parts are similar to the CFM, with simple-worded questions that are meant to assess students’ functioning (called behaviors in the tool). Still, teachers and other school staff need to be trained on the use of the checklists prior to utilizing them. The teachers should also observe their students for a period of at least two weeks before conducting the preliminary screening, and the screening should be done on all the students in the school. Based on the functioning challenges identified in Part 1, Part 2 includes a table to allow for the preliminary interpretation of the results, including linking them to specific disability conditions, which are aligned with the disability categorization established by India’s legislation. The checklist tool also contains ready forms and templates for schools to compile the data, refer students to specialized services, and communicate with and seek the consent of parents. In addition, a dedicated mobile phone application has also been developed and which schools can use to conduct the preliminary screenings, record the results digitally, and submit them in real time to state and national authorities. Prior to being launched, Prashast was field tested and vetted by education and disability sector experts, and studies were conducted to assess and confirm its reliability. Following the launch of the tool, the next phases include the practical implementation of it at state and school levels, and conducting evaluations to assess its impact. (Department of School Education and Literacy, 2022.)

The Ministry of Education, Youth and Sport of Cambodia developed 2019 guidelines for the preliminary screening of preschool children. While the target audience of that tool is younger (3-5 years) than that of this thesis (primary school-aged students), the tool can serve as another example of the adoption of a national tool and resource teachers can use to conduct preliminary screenings to identify disabilities among their students. In addition, it could be of relevance, especially during the enrolment of new students in the early grades, as well as due to its very practical approach to assessing five types of disabilities: Visual, hearing, speech, motor, and intellectual impairments. Compared to Prashast, which only relies on the observation of students, the Cambodian tool provides teachers with practical instructions on how to conduct preliminary screenings of all children using basic school materials and resources. Similar to Prashast though, the tool is only intended for preliminary screenings, and based on its findings, teachers and preschool administrators are expected to refer children to specialized services. Finally, the Cambodian guidelines are also useful considering that they also detail the policy steps required to develop, adopt, and implement a nation-wide screening framework, a necessary task should DPE decide to also pursue the development of a national disability screening framework for teachers in Bangladesh. (Ministry of Education Youth and Sport of Cambodia and Catholic Relief Services (CRS), 2019.)

In addition to the country-wide framework examples described above, a number of smaller-scale pilots and studies have been conducted in several countries, including Senegal, Ethiopia, India, Pakistan, and Fiji, all reaching similar conclusions: If teachers are provided sufficient training and practical tools, they are well suited to conducted preliminary disability assessments of their students (Shah and Kumar, 2012; Hussein and Vostanis, 2013; Desta *et al.*, 2017; Sprunt *et al.*, 2019; Braun, 2020). At the same time, though, only utilizing school-based tools and relying on preliminary screenings by teachers is not enough evidence to be able to make programmatic, financial, and other decisions (Sprunt et al., 2019, 16). Establishing referral and follow-up mechanisms is consequently an equally important part of the disability screening and identification processes.

TABLE 1. The six building blocks of an assessment and referral system (Braun, 2020, p. 16).

What?	Systematically assess AT needs
Where?	Inside and outside of schools
When?	Early and often
Who?	All children
How?	Use international classification systems to inform local practice
Why?	Global education equity

Table 1 above summarizes well the findings of the literature review, related to how, when, and why preliminary disability screening and assessment systems in and around schools should ideally be conducted.

3.4 Provision of Assistive Technology

3.4.1 Assistive Technology

AT is an umbrella term that encompasses all such products, services, and processes that assist persons with disabilities and functional difficulties, including children, use to enhance their functional abilities (WHO and UNICEF, 2022, p. 5). According to Humanity & Inclusion (formerly known as Handicap International), the purpose of AT is to maintain, increase, or improve the functional capacity of persons with disabilities (Handicap International Bangladesh, no date a, p. 5). Access to such technology is of crucial importance considering that it enables children with disabilities to participate in everyday societal activities, including education, by promoting their capacities and empowering them (Handicap International Bangladesh, no date a, pp. 11–12).

The WHO’s definitions of AT and APs are featured in Picture 2 below. The WHO’s definition of AT places little importance on defining the specific physical or digital products that can be used to assist children with disabilities to improve their functioning and independence. Instead, the definition emphasizes that knowledge and skills have to be applied within the assistive products, systems, and services sector in order to achieve the desired results. In many contexts, one could in addition also add social, political, and economic will to the list.

DEFINITIONS

Assistive technology is the application of organized knowledge and skills related to assistive products, including systems and services. Assistive technology is a subset of health technology.

Assistive products: Any external product (including devices, equipment, instruments or software), especially produced or generally available, the primary purpose of which is to maintain or improve an individual’s functioning and independence, and thereby promote their well-being. Assistive products are also used to prevent impairments and secondary health conditions.

PICTURE 2. The definitions of Assistive Technology and Assistive Products (WHO, 2016, p. 1)

ISO also has its own definition of AT, and so do a number of countries (WHO, 2016; WHO and UNICEF, 2022, p. 5). Bangladesh does not have its own, comprehensive definition of AT, but rather describes AT in policies and official documents in general terms, underlining the potential that AT has to assist children with disabilities to participate in society at large (see e.g. Bangladesh National Assembly, 1995, 2001, 2013c).

The term *technology* in AT should not (as often is the case nowadays) be confused or limited to only meaning electronic devices or digital solutions (Dron, 2021, p. 1). Technology in the context of AT should rather be understood in the manner Arthur has described technology, namely that technology is "*the orchestration of phenomena for some purpose*" (Arthur, 2009, quoted in Dron, 2021, p. 1). If we also use that as the definition of technology within the framework of AT, then understanding the purpose of using AT is essential. In this thesis, the purpose is clear: AT is to be used to enable children with disabilities in Bangladesh to access and participate in inclusive primary education on an equal basis with other children.

3.4.2 Assistive Products

Just like children with disabilities are a widely diverse group of people, so are the APs they require and use. For many, the first things that come to mind when asked to list APs are wheelchairs, blind canes, hearing aids, glasses, etc. This is understandable, as all of these are physical objects that are visible to an external person. In addition, these are also often the APs used to exemplify disabilities in public spaces, e.g. to mark the reserved seat on a bus or train, or to label the reserved spot for drivers or passengers with functional difficulties in a parking place.

But APs are much more diverse than that. Like WHO's definition highlighted, AT and APs include, in addition to diverse physical products, also software, and services, which, among others, support persons to communicate, access information, manage time, find psycho-social and emotional support, remember important things, and more. In addition, APs also include such adaptations which can be made to the built environment, when e.g. universal design models where not initially used, or when universal design models don't meet the needs of particular individuals. In that case, the APs are not necessarily personal to the individual, but they are rather flexible solutions that enhance the built environment. Examples of such APs include portable or extendable ramps or rails in buses or trains, or the use of T-Loop systems for children with moderate hearing difficulties. (WHO and UNICEF, 2022, p. 5.)

In its 2022 framework, ISO – the international entity that develops standards for almost all aspects of technology and manufacturing – classifies APs into 23 different categories (ISO, 2022). In addition, each category is further broken down into various product types within the respective categories. While no estimation could be found for the 2022 ISO framework, WHO and UNICEF estimated that the number of APs types in the previous ISO framework from 2016 was about 650 (WHO and UNICEF, 2022, p. 6). Considering the rapid development of science and technology, it is likely that the number of product types has increased even further since then, as evidenced by e.g. the WHO's confirmation on the need to update their Priority Assistive Products List (Global Cooperation on Assistive Technology [GATE], 2023).

As the below list of categories demonstrates, APs support children with disabilities to participate and overcome disabilities in a variety of contexts and scenarios, including in their private and social life (ISO, 2022).

List of AP categories by their purpose (ISO, 2022):

1. Personal mobility
2. Hoisting and lifting
3. Personal care and protection
4. Communication and information management
5. Seeing
6. Hearing
7. Voice production and recording
8. Activities and participation relating to personal mobility and transportation
9. Activities and participation relating to domestic life
10. Activities and participation relating to education and learning
11. Activities and participation relating to employment
12. Activities and participation relating to recreation and leisure
13. Environmental improvement and home modification
14. Controlling, adjusting, or measuring devices
15. Personal support
16. Safety
17. Furniture and furnishings
18. Handling objects and devices

19. Eating and drinking
20. Personal grooming and dressing
21. Carrying, moving, and handling objects
22. Securing, suspending, and fixing
23. Measuring, indicating, and monitoring.

While most APs often serve many purposes, for the sake of the categorization, each specific AP needs to be given a primary purpose. Therefore, even though a certain screen reader might also be useful to participate in education, it may primarily be categorized under hearing, personal support, or another category. While there is consequently a specific category for education and learning in the ISO framework (category 10), this is in practice not the only category within which APs can be found that support children with disabilities to access and participate in education. Within the education and learning category, one can in any case find APs related to, among others, reading, writing and notation, mathematics and science, audio-visual and multimedia, computer access, information and communication, mobility within buildings and other premises used for education and training, as well as environmental control in educational and training settings (ISO, 2022).

Considering the wide array of available APs and their respective categories and product types, WHO developed in 2016, in consultation with experts and the public, a Priority Assistive Products List (APL) containing the APs assessed to have the most significant impact on people’s lives, and for which there was the most widespread need for. While initially containing over 200 APs split into six broad domains (mobility, vision, hearing, communication, cognition, and environment), the APL was finally consolidated to “only” contain the 50 most prioritized APs. Among others, the list includes the following APs: Communication boards/books/cards, Braille writing equipment, Crutches, Handrails/grab bars, Ramps, Hearing aids, Magnifiers, Screen readers, Spectacles, Wheelchairs, etc. (WHO, 2016, pp. 1 and 4–7.)

The purpose of the APL is to support countries and authorities to identify and prioritize APs. At the same time, though, WHO underlined that the list was a general one and that national contextualization was needed, to, through the development of own lists, enhance access to products, ensure localized development and production, secure appropriate services, including maintenance, guarantee reimbursement of related costs through public and/or private entities, and more. The complete list of the prioritized APs is included in Appendix 1 and is yet another example of the diversity of APs available, and the complex task authorities are faced with in terms of prioritizing and procuring the most useful and needed products for e.g. children with disabilities to access and participate in education. (WHO, 2016, p. 1.)

While there are a significant number of reasons why children with disabilities do not have access to the APs they need, including lack of awareness and information, inefficient procurement and delivery systems, and lack of equitable distribution of APs to underserved contexts, arguing that suitable APs do not exist is not one of them. Rather, some of the greatest barriers seem to be the lack of sufficient public funding allocations, and negligence or lack of sufficiently effective policies by authorities which would ensure a rights-based approach to APs. (WHO and UNICEF, 2022, pp. 41–47.)

To enter a detailed discussion on which specific APs children with disabilities would need in order to access and participate in education is a futile exercise. There is a myriad of factors that contribute to defining which APs children might need, including the nature of their disabilities or functional difficulties, their age, the level of education they are attending or intending to attend, the setting within which the education is taking place, the level of development of the education sector, the type and complexity of the education methodology used by their teachers, and more. It is easy to understand that the APs needed to participate in education taking place in a setting where teachers only use a blackboard and chalk are very different from a context where teachers have access to digital technology and the Internet. But teachers likely use different pedagogical methodologies for different subjects even within the same contexts, which again can lead to certain children with disabilities needing different APs to be able to fully participate in education.

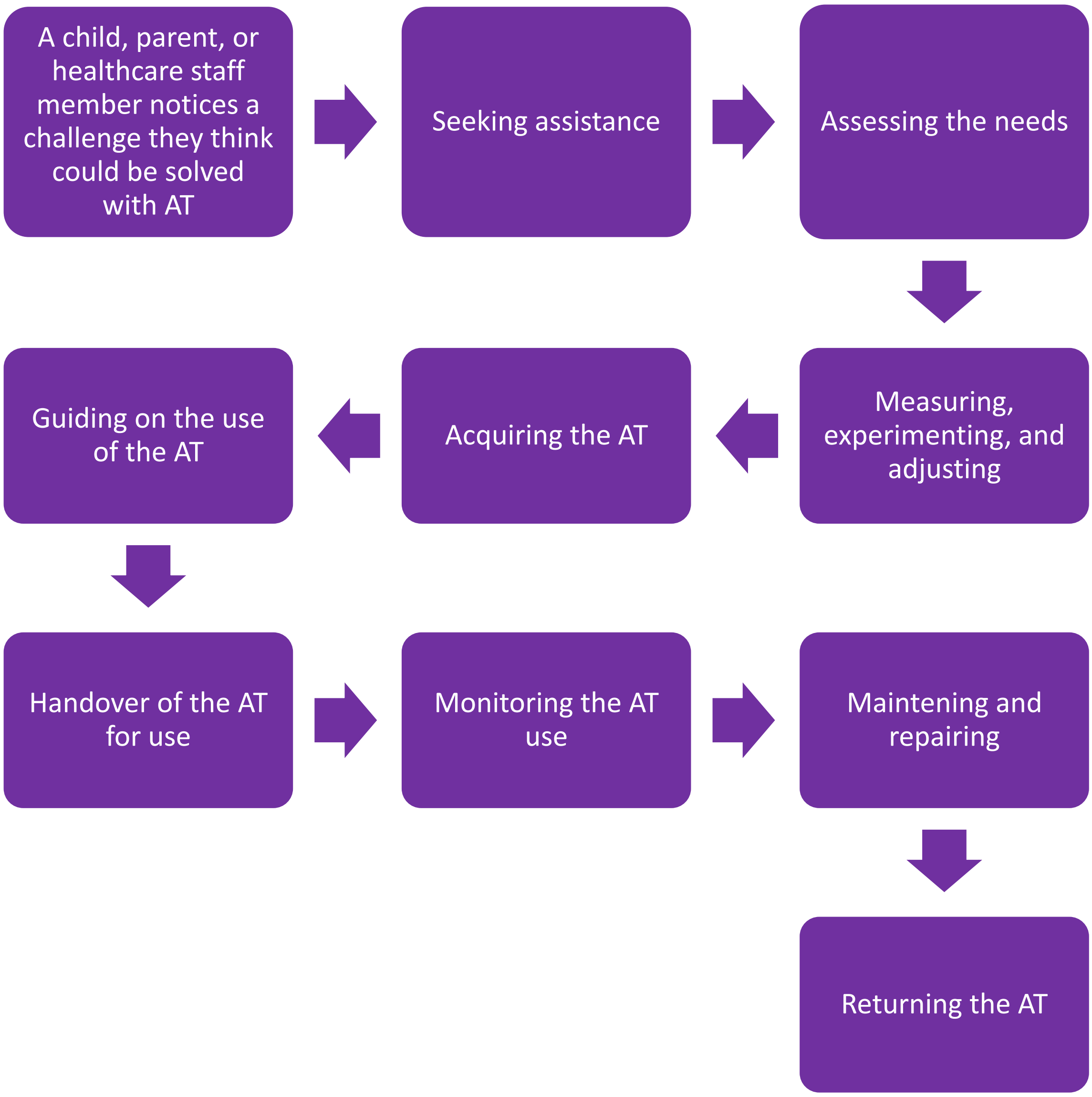
Taking the aforementioned into consideration, prior to being able to take decisions and fully taking advantage of the wide array of APs presently available to children with disabilities, it is crucial to understand the context within which education takes place and the functional abilities it requires. After that, one can start comparing the education context's specific requirements with the functional abilities of individual children participating in it, and potentially decide on the need for AT and APs, and if so, how these would be used within the classroom.

3.4.3 The Process of Providing Assistive Technology

There is no one solution only when it comes to providing AT to children with disabilities. Different countries can and should hence adjust their national or sub-national processes based on what best suits their specific contexts. While the aforementioned is true, it is also true that certain best practices have already been established in terms of the steps a well-functioning and holistic AT provision process should include. Those best practices have been identified following extensive trialing and erroring conducted over several decades across diverse contexts around the world. Based on the lessons learned, authorities can today set up processes that, at least for now, have been assessed to best meet the short-, mid- and long-term needs of children with disabilities. That includes, acknowledging that the provision of AT is highly personal and that, rather than a one-time activity, provision should be seen as a long-term relationship and commitment between the authorities that provide AT services and the children that require them.

Picture 3 below showcases one example of the most commonly used steps in a holistic AT provision process (Sosiaali- ja terveysministeriö, 2018, p. 26). The example is from Finland, but it is aligned with globally made recommendations by UN agencies and other stakeholders, as well as adopts a similar approach as the processes used by other countries with developed AT provision processes (see e.g. Handicap International Bangladesh, no date a, pp. 13–15; Steps to Assistive Technology Provision, no date; Andrich et al., 2013, p. 136; World Health Organization (WHO) and United Nations Children's Fund (UNICEF), 2020, p. , p. 136; WHO and UNICEF, 2020, p. 11, 2022, pp. 14–17; Karki et al., 2022, p. 2). Some even argue that these should be considered the minimum components or steps of a truly functional system (Karki *et al.*, 2022, pp. 1–2).

In addition to the below example, a second example of an AT provision process and checklist – developed by Humanity & Inclusion specifically for the Bangladeshi context and aligned with global best practices – is included in Appendixes 3 and 4 (Handicap International Bangladesh, no date a, pp. 104–105, no date b).



PICTURE 3. The Finnish AT service process (author's own translation from Finnish) (Sosiaali- ja terveysministeriö, 2018, p. 26).

A brief description of the key activities related to each of the steps in the Finnish process is detailed below. The descriptions compile though best practices and recommendations found in all of the national and international resources referred to in the previous paragraph (Handicap International Bangladesh, no date a, pp.

13–15; Steps to Assistive Technology Provision, no date; Andrich et al., 2013, p. 136; WHO and UNICEF, 2020, p. 11, 2022, pp. 14–17; Karki et al., 2022, p. 2).

Identifying a challenge: In the first step, a child and/or their parents notice a challenge the child is facing in participating in society to the same extent as their peers, which they believe could potentially be overcome or lessened through the use of AT. The challenge could though also be identified by others, including teachers, healthcare professionals, sports coaches, etc. The identification can take place in any place and situation, including at home, in school, during healthcare check-ups, practicing hobbies, etc. Identifying certain challenges might require specialized training, while others could be identified by most individuals interacting closely with the child. The entire AT provision process does not in practice start before a challenge has been identified, i.e. screening children for disabilities is not per se a step in the AT provision process (it is a separate process, which might though also lead to activating an AT provision process).

Seeking assistance: Once a challenge has been identified, the child and their parents need to seek assistance from appropriate service providers, to better understand the nature of the challenge and its consequences for the child. A crucial part of the process is having access to detailed, easy-to-understand information on the services and service providers that are available to support the assessment of the child. In addition, the information should also detail how to access the services, and an indication of the maximum waiting time to access the services. In many cases, the service providers are healthcare professionals, including doctors and nurses, but it could also be psychologists, speech-language pathologists, social workers, therapists, etc. These service providers might be based in or able to come to schools, but it might also be necessary for the child to visit the service provider, especially in case the assessment of the challenge requires more specialized equipment or testing modalities.

Assessing the needs: Having found the most appropriate service providers, their trained professionals need to assess the challenge the child is facing as well as the possibility to use AT to overcome or lessen the challenge. The assessment could require diverse examinations, including the monitoring of the child over a certain period of time, including in school and at home. In addition to the professional service providers, also the participation and cooperation of parents and teachers might be needed, especially related to the potential monitoring of the child’s behavior and the challenge he/she faces. Following the assessment, the service providers document their findings in an official report, including, if relevant, their recommendations on the use of AT. If the use of AT is recommended, the child should next be referred to relevant service providers that can assist in the identification and acquisition of the most suitable AT.

Experimenting with AT: Identifying the most suitable AT is a highly technical activity that requires expertise and experience. Based on the challenges identified, trained AT service providers should therefore be engaged in making recommendations on the potential AT to be used. Considering the significant amount of AT solutions available, the service providers will need to, together with the child and their parents, trial various options in order to identify the most suitable solution. That trialing includes, when relevant, the measuring of the child and/or AT and trying various options over a certain period of time, before finally taking a joint decision on the AT that best meets the needs of the child. The most suitable AT solution might be a standard AP, but it might also be that personalized AT will have to be acquired to meet the specific needs of the child.

Acquiring the AT: After having found the most suitable AT solution, it is usually the responsibility of the AT service provider to lead the subsequent procurement process. The more specialized and personalized the AT solution that has been recommended for the child, the more likely it is that the AT service provider will not have it available in stock but will need to special order it from suppliers. This step in the process involves therefore often engaging third-party providers, such as the producers, importers, or distributors of AT. Until the permanent AT solution is available, the child might need to be provided temporary AT. In this case, extra consideration will need to be placed on ensuring the temporary AT does not aggravate or lead to additional challenges for the child.

Guiding on the use of AT: Before starting to use any AT – be it for trialing purposes or prior to the handover of a temporary or permanent AT solution – the AT service providers need to guide and inform the child, parents, and where relevant teachers and other staff or even peers, on the use of the AT, including the basic cleaning and maintenance of it. This is the case with even the most basic or commonly used AT as if the AT is used incorrectly, it can aggravate the existing challenge or lead to new ones. Sufficient time needs to be reserved for guidance, and it will likely include both theoretical as well as practical elements. The guidance will ideally not only be done orally but the child and parents would also receive information in such written format which is accessible to them in terms of language, terminology, and style.

Handing over the AT: After the permanent AT is available and the child, his/her parents, and other relevant stakeholders have been guided on its use, it can be handed over to them. Especially if the AT is being lent to the child and his/her parents, but even in the case when the child and his/her parents become the owners of the AT (the AT is provided with no expectation of it being returned to the authorities), it is important to have written proof of the handover in the form of a receipt or similar documentation. In case the AT is being lent, the lending document should at least mention the responsibilities of each party, and the consequences of not fulfilling those responsibilities, including financial ones. Lending is most likely to occur in AT provision systems that are managed by public authorities but could also be considered by OPDs and other civil society and private entities that have long-term AT provision programs in place.

Monitoring the use of AT: The provision of an AT service does not end after the AT is handed over to the child and his/her parents; it is only one more step in the new relationship between the AT service provider and the child and his/her parents. Following the handover, various stakeholders are responsible for monitoring the child’s use of the AT, including if it is meeting its purpose and if further adjustments or enhancements need to be made to it. Among others, the child him/herself, the parents, the teachers and other school staff, medical professionals, and others can provide feedback on the suitability of the solution, based on which AT service providers, together with the child and his/her parents, will take decisions on potentially adjusting the AT. Meetings with the AT service provider to discuss the experience with the AT will likely be more frequent in the first months after having been provided the AT (e.g. once per month or quarter), and likely decrease with time as the suitability of the AT has been confirmed. As a consequence of the meetings, it might be decided that the child’s AT requires maintenance, or that the AT does no longer meet the needs of the child due to e.g. the child having grown or the challenge having evolved. In the latter case, a return to the Assessing the needs or Experimenting with AT steps might be required in order to identify a new solution that matches the new needs. The active follow-up with the child and his/her parents is hence a vital part of the AT provision process, as also the usage of AT is an evolving process.

Maintenance: The child and his/her parents are responsible for the everyday maintenance of the AT, including keeping it clean and ensuring it is stored adequately, if relevant. AT service providers are on the other hand responsible for more significant repairs, as well as periodic maintenance work. Periodically and adequately maintaining and servicing AT extends its lifespan, hence resulting in a diminished need to acquire new AT, and also financial savings for both the authorities as well as likely also for the child and his/her parents. Every AT should therefore be serviced from time to time, based on the recommendations stipulated in the instruction notes of the specific AT. It is primarily the responsibility of the child and his/her parents to reach out to the AT service providers to request the periodic maintenance of the AT based on the AT’s instructions. Not doing so may be a breach of the lending agreement (if such has been entered), and may have consequences, among others financial.

Returning the AT: In case the AT was lent to the child, it should be returned to the AT service provider when its use is no longer relevant; be it because the child has outgrown the AT, the challenge has been overcome, another more suitable AT is now in use, or something else. If possible, the AT should then be maintained and repaired as needed, and made available to another individual in need of it. In addition to ensuring the efficient use of public funding, it also contributes to reducing the environmental impact of producing, using, and disposing of AT (Oldfrey *et al.*, 2021, p. 5).

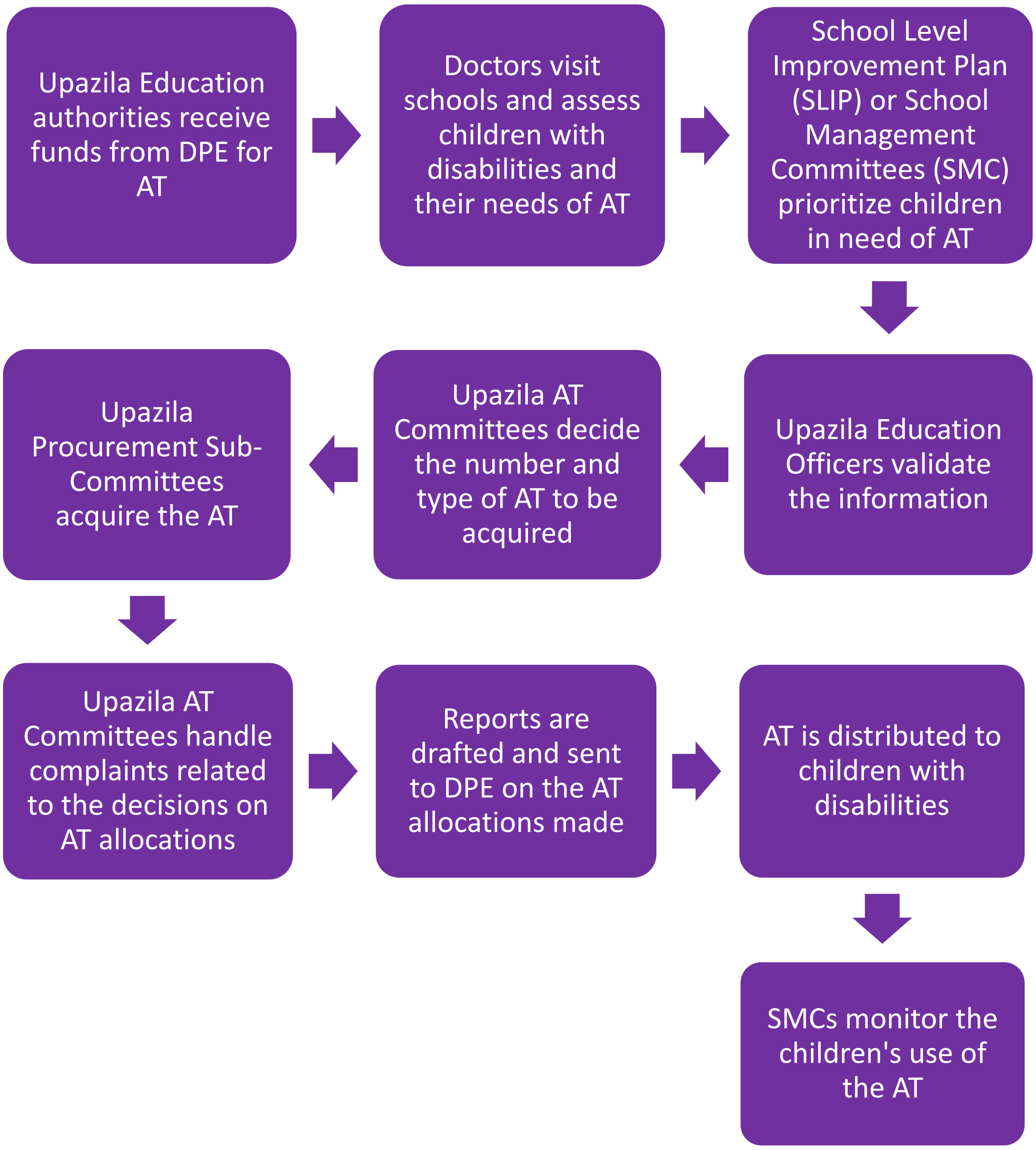
The AT provision process described above is not specifically designed to be implemented through an education system, but it often requires a practical collaboration between a number of authorities and multidisciplinary stakeholders, including education, healthcare, and social welfare representatives. In Bangladesh, aside from the GoB’s primary AT provision process which is led by health authorities, DPE is presently providing AT to primary school students with disabilities through a separate process detailed in their Policy on Assistive Devices (DPE, 2016). A brief description of that DPE-led process is summarized below, as well as how it compares to the global best practice processes detailed above.

3.4.4 Providing Assistive Technology through Schools

The DPE Policy on Assistive Devices was adopted in 2016 and is the legal framework that presently guides the education sector’s provision of AT to primary school students with disabilities. According to the policy, DPE allocates annually 50,000 Bangladeshi Taka (BDT) (approximately 470 United States Dollars [USD]) to each of the country's 492 Upazilas (sub-districts) to provide AT to children with disabilities, i.e. 24,600,000 BDT or approximately 230,000 USD for the whole country. Considering that each Upazila has on average 34,500 students, the allocated funding represents only 0.7 BDT per student (approximately half a USD cent). In case only children with disabilities are considered, the annually allocated funding for AT represents approximately 250 BDT (approximately 2.3 USD) per child with disabilities. It is evident that these amounts are not sufficient to cover the actual costs of the AT needs children with disabilities in primary schools have, and that either they will not have access to AT, or other stakeholders are at the moment compensating for the gap, including parents, OPDs, NGOs, or other GoB entities. (DPE, 2016, 2022a)

Once DPE has allocated the funding to the Upazila education authorities, the below process described in Picture 4 is triggered, where each Upazila is responsible for the identification of the children with disabilities that study in the schools they manage, and for the procurement and distribution of AT to those in the most urgent need of it. The below Picture 4 provides an overview of the process, with a more detailed description of the steps being included in the next chapter, while discussing how this process compares to globally established best practices for AT provision, including how the quality of the services is ensured.

It is important to note that the AT provision model DPE presently uses is completely independent of the GoB’s primary AT provision process, which relies on CDCs, CCs, and other public healthcare service providers for the identification of disabilities among the population, as well as the referral of individuals in need of AT to dedicated service providers (though the latter is very limited in scale and scope). Based on the expressed intentions for the planned DPE-UNICEF pilot, it seems DPE is looking to continue its independent provision model also in the future.



PICTURE 4. The AT provision process through primary schools in Bangladesh (DPE, 2016).

While not featured in the above process flow, aside from Upazila level authorities, also Union Council level (a “sub-sub-district” administrative level in Bangladesh) education and other authorities are given certain responsibilities in the DPE policy, hence decentralizing further the decision-making power but also the responsibilities for ensuring the quality of the provided services. While decentralization is in general welcome, in the case of the DPE policy, the decentralization of responsibilities to Upazila and Union education authorities poses some challenges as these have limited capacities to manage holistic AT provision services due to their primary expertise being in other areas.

While there are certain benefits of continuing working with an independent model, significant limitations do also exist, and these will need to be taken into consideration when assessing which model best meets in practice the long-term needs of children with disabilities.

Some of the most significant benefits of using an independent process include: 1) DPE complements existing AT provision programs, ensuring additional primary school students benefit from AT, which in turn leads to more children with disabilities being able to access and participate in education; 2) DPE does not need to rely on the performance of other authorities to ensure their students have access to AT; and 3) DPE can independently adjust its AT provision policy and other legal frameworks, as needed, and consequently take faster decisions related to the practical provision of AT.

On the other hand, some of the most significant disadvantages of using an independent process include: 1) By establishing its own process, DPE is duplicating efforts as similar processes are already established and being used by other authorities. In the worst case, due to the duplication, fewer children have in practice access to AT; 2) None of the stakeholders presently involved in the DPE-led process have sufficient qualifications nor experience to ensure the provision of AT to children with disabilities meets expected quality standards; and 3) Not being DPE’s core competency area, the authority has limited capacity to ensure proper AT support to children with disabilities over the long-term. This could lead to a situation where AT is also in the future seen as a one-time activity, rather than a long-term and continuous support process.

There is no straightforward answer on which model is better – DPE continuing to develop and implement its own, independent model, or opting to develop it in such a manner that it establishes closer synergies with the GoB’s primary AT provision model – as it will largely depend on how both these models develop in the coming years. The first-mentioned, independent model is a rarity on a global scale though, as most countries try to unify their processes, often utilizing education systems as early points of screening and identification, to from there refer children to specialized AT service providers.

For DPE to be able to justify its own process and model, the quality of its AT provision outcomes would have to be significantly positive, and it would have to ensure the model complements rather than duplicates GoB’s efforts. No documentation could though be acquired or identified as part of the secondary data collection for this thesis on potential evaluations made on the impact of the DPE’s model. From discussions with DPE representatives and other sector stakeholders, it seems such evaluations have not been conducted so far, and should probably be prioritized in the coming years.

4 DISCUSSION

4.1 Comparing the DPE Policy and Global Best Practices

In addition to the observations made in the previous sub-chapter, Table 2 below showcases how the DPE AT provision policy and process compares to the globally established best practices identified and discussed in the Literature Review chapter. In addition to simply highlighting differences between the two approaches, the objective is to understand within which areas DPE is providing holistic AT services to students with disabilities, and within which areas further enhancements could still be considered and tested as part of the planned DPE-UNICEF pilot.

TABLE 2. Comparison between the DPE's AT provision process and established best practices.

Globally Established Best Practices	Process in the DPE Policy	Remarks on the DPE process
A child, parent, or healthcare staff member notices a challenge they think could be solved with AT		This step is not directly part of the DPE process. Most children do not have access to regular healthcare checkups through schools, and the identification of a challenge is therefore likely to take place at home, school, or other settings.
Seeking assistance		The DPE process does not provide opportunities for children or parents to seek support in case they suspect a disability, other than when funding has been allocated for AT and a doctor visits the school. Rather than needs-based, it is hence reactive and dependent on available funding.

Globally Established Best Practices	Process in the DPE Policy	Remarks on the DPE process
Assessing the needs	• Upazila Education authorities receive funds from DPE for AT • Doctors visit schools and assess children with disabilities and their needs for AT • SLIP Committees / SMCs prioritize children in need of AT • Upazila Education Officers validate the information • Upazila AT Committees decide the number and type of AT to be acquired • Upazila AT Committees handle complaints related to the AT provision decisions • Reports are drafted and sent to DPE on the allocations made	The DPE process blends together the Assessment of needs and identification of suitable AT (Measuring, experimenting, and adjusting) into one process, which falls short in terms of the expertise involved in the processes: The screening at the school level is conducted by a doctor (general practitioner), while non-trained community members and multidisciplinary committees are responsible for the decision making at school and Upazila level, respectively.
Measuring, experimenting, and adjusting		There are presently no possibilities to trial AT in DPE's process. The AT provided to children with disabilities is based on the notes the doctor made during the screening phase (based on a general screening), and the APs eligible and available to be procured by the Upazila Procurement sub-Committee.

Globally Established Best Practices	Process in the DPE Policy	Remarks on the DPE process
Acquiring the AT	Upazila Procurement Sub-Committees acquire the AT	The procurement of AT in the DPE process is done at the Upazila (or in some cases Union Council) level. No detailed information is available on how the process takes place in practice, nor if the process can take advantage of agreements negotiated and entered at a national level. Based on other studies, it is likely most AT is produced and procured locally (Karki *et al.*, 2022, p. 8).
Guiding on the use of AT		The DPE process does not include any provisions related to AT use guidance. As it is the SLIP Committees and SMCs that make the distribution, the DPE policy likely places the responsibility of guidance on these entities. Considering that SLIP Committees and SMCs lack in-depth knowledge and experience on AT, it is likely the guidance provided to children is limited.
Handing over the AT	AT is distributed to children with disabilities	SLIP Committees and SMCs are provided the AT from the Upazila Procurement Sub-Committees and are responsible for its distribution to children.

Globally Established Best Practices	Process in the DPE Policy	Remarks on the DPE process
Monitoring AT use	SMCs monitor the children's use of the AT	SMCs, and where relevant also SLIP Committees, are responsible for monitoring if the AT provided to the children in their schools is suitable and meets their needs. These committees receive no or limited training on how to do that in practice, nor does the guidance detail how they should deal with a situation where it is found that the provided AT is not suitable or does no longer meet the children’s needs.
Maintenance		The DPE process ends after the provision of the AT, consequently signaling that the AT provision is a one-time activity. The maintenance and repairing of the distributed AT is therefore the responsibility of the children that received the AT (and their parents). It is unclear if children can acquire new AT through the DPE’s process should the previously acquired AT no longer be fit for purpose.
Returning the AT		In the DPE model, the children (and their parents) become the owners of the AT and are not expected to return it once it is no longer used.

The DPE process relies to a large extent on different parent-teacher committees within the schools, as well as on Upazila Education Officers that validate and facilitate the process. It is not clear from the policy how these stakeholders are trained to ensure they have the capacity to manage these responsibilities, some of which are highly technical (e.g. the responsibility to take a decision on the prioritization of the children that are in most need of AT), but based on the author's personal experience, it can be assumed that the capacity building organized for these school-based committees is limited, if it is organized all. This likely results in disparities related to the various decisions the different committees take, due to the lack of sufficient training, standardization, and guidance.

To support the committees in their decision-making, doctors are deployed to assess school children, with the objective to identify disabilities and children's potential AT needs. While this is helpful, it should be noted that these doctors are general practitioners, who might not be sufficiently trained to either 1) identify specific disabilities, or 2) identify the most suitable AT for each child. As was highlighted when discussing the best practices related to AT provision in other contexts, these two tasks are usually separated and will especially in more complex disability cases require professionals specifically trained in the identification of disabilities and AT provision. Relying only on general practitioners can consequently lead to only identifying the most common disabilities and providing those children with the most common types of AT (crutches, hearing aids, wheelchairs, etc.), hence missing or neglecting the needs of children with more complex disabilities (not only those with severe disabilities but also children with non-physical disabilities). That in turn would result in a situation where the objective of the whole process – providing AT to the children with the most urgent needs – might not be achieved as only children with easy and obvious cases end up being supported with AT.

According to Humanity & Inclusion Bangladesh, for AT to be appropriate for its user, it needs to, among others, meet the user's clinical, functional, socio-economic, and developmental needs. In addition, it needs to meet the relevant environmental conditions, fit properly, support posture, be safe and durable, have an adequate cost, and be purchased, repaired, and maintained locally (Handicap International Bangladesh, no date a, p. 12). It can be assumed that it is presently rather challenging for a doctor visiting a school to during a single, short visit be able to conduct an assessment and make AT recommendations that ensure all the above criteria are met.

The DPE's process includes also the establishment of Upazila AT Committees to take decisions on the provision of AT to children with disabilities, based on the recommendations submitted by schools. These committees are multidisciplinary in their composition, having about 20 members that represent DPE, teachers and school staff, students, social affairs authorities, NGOs, Upazila/Union Council administration, and technicians/engineers. While the multidisciplinary composition is welcomed, it is not evident how detailed the information that their members receive on the specific cases they are dealing with is, and how much time they have available to review those cases as well as discuss them. The end-users – the children that are in need of the AT (and their parents) – nor the doctors that participate in the screening process in schools (nor any other doctors or healthcare staff for that matter) are involved in the committees' discussions, to validate and provide more details on the matters being discussed. Considering all the aforementioned, it is hence unclear how informed the decision-making of these committees truly is.

The author's own view is that DPE should seek to bring its AT provision process closer to the GoB's primary AT provision process, if not merge them altogether. The main reason for this view is the fact that the present DPE process falls short in many areas compared to globally established best practices for holistic AT provision. It is also challenging to see how these shortcomings could be easily overcome, especially considering that DPE's mandate is different from that of those specialized services that usually lead AT provision services.

Taking the aforementioned into consideration, concrete recommendations are presented further below, on how DPE could go about adjusting its process to better meet global best practice standards, as well as how the planned DPE-UNICEF pilot could be a first step in that direction.

4.2 Recommendations

Based on the literature review as well as the comparison between the present DPE AT provision policy and process, and global best practices, the author proposes a total of 15 recommendations. These are specifically targeted at enhancing the development, planning, and implementation of the planned DPE-UNICEF pilot. In addition, though, adopting these recommendations could also in general enhance DPE’s and UNICEF's work related to inclusive education in Bangladesh, especially for students with disabilities.

4.2.1 Adjusting the Used Terminology

As has been highlighted in this thesis, DPE presently uses the term ADs to refer to the distribution of physical materials (mostly basic APs such as wheelchairs, crutches, glasses, hearing aid, etc.) to children with disabilities to support their access to and participation in primary education. While it is accurate to use the term when referring specifically to devices (external products), DPE seems to also use the term when referring to the whole AT provision process, though the procurement and handing over of an AP is only one small part of it. Considering that AT provision should be a holistic service, rather than a one-time material distribution, it would be recommended to reconsider the terminology presently being used.

In addition, DPE presently uses the term special needs when describing the services and support provided to children with disabilities. As has been argued in this thesis, such emphasis on children with disabilities having “special” needs compared to other children does not seem to align with inclusive education philosophies. Ideally education should be organized in such a manner that it is inclusive of all children, without specifically having to highlight certain groups as having special needs compared to others. Terms such as inclusive education should therefore be prioritized over special needs.

In line with WHO’s and other international stakeholders’ definitions of AT, AD, and inclusive education, the author recommends therefore:

1. Using the term AT when describing the holistic process of providing AT services to students with disabilities and using the term AD only when describing the external products that are being provided. In case the recommendation is adopted, DPE (and where relevant UNICEF) should ensure to use the new terminology when developing the planned pilot, when updating or adopting new inclusive education policies, and any other resources that describe the provision of AT through the education system.
2. Considering that children with disabilities are not “special” compared to other children, nor do they have “special” needs, DPE should reconsider the use of the terminology special needs education, instead opting for inclusive education in its policies and practices.

4.2.2 Engaging Teachers

Presently teachers in Bangladesh do not participate in the preliminary screening of disabilities among their students. At the same time, healthcare and other sectors have few opportunities to do this either due to their limited human and financial resources. Considering that teachers are especially well placed to identify potential disabilities among their students due to e.g. the extensive amount of time they spend with the children, not engaging them in the disability identification process is clearly a lost opportunity.

Following experiences and best practices from other contexts, the author recommends DPE to actively engage teachers in the preliminary screening of disabilities among their students. The screening should not only be done in order to potentially provide them with AT, but in general to ensure they receive the pedagogical and other support they require in order to participate in education and society in general. For this, at least three steps would need to be taken:

3. DPE would need to either adjust the existing policy on AT provision or develop and adopt a new one, which would stipulate how teachers should contribute to the process of screening of disabilities among students. In addition to detailing the specific screening process, the policy should also clarify how children with suspected disabilities will be referred to

specialized services, to participate in further assessments and be provided personalized support, if relevant.

4. To conduct the preliminary screening of disabilities, teachers will need an easy-to-use tool to guide the process and document the findings. Various tested and validated tools are already available, which DPE could consider translating and using as such. In addition, DPE and UNICEF could also consider requesting access to pilot the MCF-TV and IEM frameworks in Bangladesh. Alternatively, a tool specifically for the Bangladeshi context could also be developed. The latter would though take longer, among others, as the development process and vetting would need to be done together with multidisciplinary partners representing at least education and health, with the latter most probably leading the whole process.
5. In order to accurately and efficiently use the aforementioned tool, teachers would need to be trained in the preliminary screening of children. This training should ideally be part of both pre-service as well as in-service training, and it should include practical simulations. For in-service training, the training could be part of inclusive education training packages, ensuring though that sufficient time is allocated for it. In addition, all teachers should be trained even more than what is taking place today in identifying common disabilities among their students.

4.2.3 Providing Additional Capacity Building Opportunities

The provision of AT is a technical process that requires experience and expertise. Presently the AT provision process within primary schools is though mostly led and conducted by stakeholders with no or only limited training to take up those responsibilities. In order to enhance the quality of the AT provision services and ensure children with disabilities receive the support they need and deserve, the author recommends providing capacity-building opportunities for those stakeholder groups that are key in the provision of AT through schools:

6. Relevant DPE staff members should be provided opportunities to learn about global best practices related to the provision of AT services, in particular how schools and education stakeholders are being engaged in

the processes. Such capacity-building opportunities should at some point also be extended to staff members in the field, including Upazila education offices, as these are responsible for the practical implementation of the AT provision policy.

7. Being responsible for monitoring the suitability of the AT provided to children with disabilities, SLIP Committee and SMC members should be offered capacity-building opportunities to enhance their general experience with disabilities and AT. In addition, they should be provided clear guidelines on the steps to follow should they identify any child that is facing challenges in terms of using the AT provided to them.

4.2.4 Reaching the Children in Most Need of Support

The DPE's present AT provision model seems to foremost target and reach children with physical disabilities who can be supported with basic APs. Some of the reasons for the model not reaching children with other disabilities includes: There is limited funding available to support children with AT; no disability and AT professionals are involved in the disability screening and AT provision process; children with the most challenging needs are likely not enrolled in the schools in the first place (they are either completely out of school, or they participate in education through "special needs schools"); etc.

While all support to children with disabilities is welcomed and commendable, the objective of the DPE's policy on AT provision is specifically to support those children with the most urgent needs. The author is of the view that the present model falls short of that objective at the moment, but could be steered to better address the objective by adopting the following recommendations:

8. Considering DPE's current limited funding allocations to the provision of AT, it is challenging for the sector's stakeholders to provide children with disabilities with more than basic APs. It is also challenging for them to provide continuous and sustainable support. To ensure additional children, and in particular those with more challenging needs, are supported, DPE should consider increasing the funding allocated to the provision of AT,

especially considering the allocation has not changed since 2016. In addition to its own funding, DPE should actively seek funding opportunities both internally (MoPME and other line ministries) as well as externally (donors and global partners).

9. DPE should continue to complement AT provision services, as long as it also assumes an active role in the referral of the cases its schools are not able to manage to the relevant specialized healthcare and AT services. DPE should therefore prioritize encouraging schools to establish linkages with healthcare centers and other services providers to whom teachers and other school staff can refer children in need of such support which the DPE AT provision model is not able to provide. DPE should facilitate the process by ensuring political and administrative support for such collaborations, as well as developing the necessary guidance for all stakeholders that will be part of the process.
10. Considering the experience it has acquired over the past years, as well as its firm commitment to also continue providing AT to students with disabilities in the future, DPE should assess how it could develop its model further, to effectively support children with more complex needs. For this, DPE should encourage Upazila and school-level stakeholders to, when relevant, procure more specialized and personalized APs for children that require them, rather than only relying on basic APs. In addition, DPE should also encourage teachers and other school staff to start developing individualized education plans which ensure the holistic needs of children are assessed and addressed, including how the child’s potential use of AT will be taken into consideration in the teacher’s pedagogical approaches and methodologies.

4.2.5 Enhancing the AT Provision Cycle

As has been highlighted in the analysis of the DPE’s AT provision policy, presently the distribution of APs is mostly seen as a one-time activity. At the same time, global best practices emphasize the need to see AT provision as a holistic, long-term service and relationship between children with disabilities and AT service providers and other relevant authorities. To further enhance the DPE’s long-term AT provision service to primary school students with disabilities, the author proposes therefore the following:

11. As part of the AT distribution process, greater emphasis should be placed on guiding the children that are provided AT, their parents and teachers, other school staff, and peers, as relevant, on the use of the AT, as the inappropriate use of even the most basic AT can have significant negative consequences for the child. The DPE's AT provision policy should consequently be updated to also define the stakeholders responsible for guidance on the use of AT and the training they will receive in order to accomplish the task. In addition, DPE should ensure each AT comes with printed, easy-to-understand, practical guidelines that are distributed when handing over the AT.
12. As all AT requires periodic maintenance and repairing, DPE should allocate part of its AT provision funding to these activities, or explicitly guide the AT provision policy's implementing stakeholders to reserve part of the funding for that purpose. This would not only ensure DPE supports children with disabilities using AT over a longer period of time (ideally the whole time they participate in primary education, if required), but it would likely also lead to cost-savings as proper maintenance and repairing of AT is on the mid- and long-term more affordable than frequently discarding and acquiring new ones. In addition, it would likely contribute to the local economy as many APs can be produced and repaired locally, and also reducing its environmental impact as regularly maintained APs have a longer lifespan than non-maintained ones.

4.2.6 Evaluating the Present DPE Process

The present DPE policy on AT provision has been implemented since 2016. During that time, no detailed evaluation has been conducted which would provide answers to questions such as e.g. what has been the impact of the model on retaining children with disabilities in primary schools; how have the various stakeholders been able to fulfill their responsibilities; have the children with the most urgent needs been reached; how have the beneficiaries assessed the quality of the AT distributed; what has been the most requested and needed AT; what has been the most commonly distributed AT; how does the DPE-led AT provision process compare to the GoB’s primary process in terms of quality, cost-efficiency, reach, etc. While this thesis provides an initial assessment of the policy and its implementation, an in-depth evaluation would need to be conducted in order to better understand the value of the DPE’s model. The author recommends therefore:

13. Conducting an in-depth assessment of the impact the DPE’s AT provision model has had on children with disabilities’ access to and participation in primary education. As part of that assessment, challenges, opportunities, best practices, and lessons learned should be collected, analyzed, discussed, and disseminated to all relevant stakeholders, to inform the future development of the model or alternative ones.

4.2.7 Reaching Out-of-School Children

One of the shortcomings of the present AT provision model is that it only targets children with disabilities that are already enrolled in primary schools. As such, it likely contributes to retaining children in school, but it does not necessarily contribute significantly to supporting children with disabilities that are out of the school system due to not having access to such AT which they would need in order to participate in education. As was highlighted earlier, children with disabilities not only have a higher dropout rate compared to other peers, but they are also significantly overrepresented in out-of-school statistics.

While DPE has a legally mandated responsibility to actively enroll all children in primary school, it has also, together with other education authorities, a responsibility to ensure out-of-school children are provided such support that practically enables them to overcome the barriers that hinder them from enrolling in school and participating in education. The author proposes therefore the following recommendations:

14. DPE should collaborate closely with other stakeholders to ensure a lack of access to AT is not a barrier to participating in primary education. This could be, among others, by establishing collaborations with pre-primary education providers on the preliminary screening of their children and ensuring children that need it are provided with AT as soon as possible after they start primary education. This might require DPE to allocate a certain percentage of AT funding specifically to target first-year students, at the very beginning of the school year.
15. DPE should as part of regular enrolment campaigns try to identify children that are at risk of not enrolling in school due to a lack of access to AT. When identifying such cases, DPE should seek viable ways of supporting them by e.g. referring them to specialized disability and AT provision services, or by ensuring schools conduct preliminary screenings of the students as soon as possible after they start school, and if required providing them with AT shortly thereafter.

4.2.8 Summary of Recommendations

TABLE 3. Summary of the Thesis' Recommendations

Recommendation	Description
Adjusting the Used Terminology	1. Shift from using AD to AT when referring to the holistic process of providing AT to students with disabilities. 2. Shift from using special needs education to inclusive education, to abstain from emphasizing that children with disabilities are somehow “special” compared to other children.
Engaging Teachers	3. Either adjust the existing AT provision policy or develop a new one, to allow for the use of teachers in the preliminary screening of disabilities among children. 4. Either adopt an existing tool (translating it into Bengali) or develop a new one for teachers to regularly screen their students. 5. Train teachers on the use of the preliminary screening tool, and in general identify common disabilities among their students.

Recommendation	Description
Providing Additional Capacity Building Opportunities	6. Train relevant DPE staff members on global best practices related to AT provision and how these could be adopted in the education system in Bangladesh. 7. Train SLIP Committee and SMC members on how to monitor children's use of AT, including where to refer them should any challenges be identified.
Reaching the Children in Most Need of Support	8. Increase the DPE's budget allocated to AT provision through schools. 9. While DPE focuses on the provision of basic APs, ensure children with more complex needs also have access to the AT they need, among others by referring them to specialized AT services. 10. Develop individualized plans and AT solutions for children with more complex needs.
Enhancing the AT Provision Cycle	11. Ensure children, parents and teachers receive guidance on the use of distributed AT. 12. Allocate funding for the regular maintenance and reparing of distributed AT.
Evaluating the Present DPE Process	13. Conduct an assessment of the impact of the present DPE AT provision process on access and participation in education, including experienced challenges and opportunities to enhance the initiative further.
Reaching Out-of-School Children	14. Assess how partnerships with other stakeholders, including pre-primary education providers, could assist to identify upcoming first-year students with disabilities in need of AT support. 15. Identify children at risk of not enrolling in school due to a lack of AT during enrolment campaigns and find viable ways to support them.

5 CONCLUSION

5.1 Review of Research Questions

This thesis sought to answer the following main research question:

What are the best practices related to the procurement and distribution of assistive technology DPE and UNICEF in Bangladesh should take into consideration when developing its pilot for primary school students with disabilities?

To contribute to answering the main research question, three sub-questions were defined, focusing on past and present AT provision experiences in Bangladesh and other contexts, as well as how the lessons learned from these experiences could be utilized to inform the planned DPE-UNICEF pilot. Concretely the sub-questions were:

- Research sub-question 1: How is AT being procured and distributed to children and school students with disabilities in Bangladesh and other contexts at the moment?
- Research sub-question 2: What best practices and lessons learned on the procurement and distribution of AT to children and school students with disabilities have been generated by other stakeholders in the past in Bangladesh and other contexts?
- Research sub-question 3: How could the aforementioned best practices and lessons learned be utilized by UNICEF and DPE to enhance the design of their planned pilot?

While the main and sub-research questions were drafted to focus on analyzing procurement and distribution practices, it became evident during the literature review phase that, rather than only emphasizing these two steps in the AT provision process, a more holistic review of AT provision services for children with disabilities would need to be conducted. The discussion and the recommendations made as part of the thesis extended therefore beyond merely analyzing procurement and distribution, to reviewing every step of the AT provision process – both DPE’s as well as that being used in other contexts – and making recommendations that aimed at contributing to the establishment of a more holistic, long-term AT provision service through primary schools in Bangladesh.

Through the literature review, the thesis was able to identify best practices related to AT provision services proposed by international stakeholders, such as WHO, UNICEF, Humanity & Inclusion, and more, and based on them, how AT is today being provided to children with disabilities in various countries around the world, including India, Finland, and Cambodia. In addition, the thesis was also able to identify how AT is presently being provided to persons with disabilities in Bangladesh through the GoB’s primary AT provision process (which relies on CDCs and CCs), as well as how students with disabilities in particular are being provided AT through the DPE’s AT provision model in primary schools. All of the above was done through both an analysis of legislation, policies, and international frameworks, as well as academic literature assessing the provision of AT services in various contexts.

By comparing the findings of the literature review with DPE’s current AT provision policy and practices, the thesis was able to identify good practices as well as areas of potential further development. Taking that into consideration, the author proposed 15 recommendations aimed at specifically informing the planned DPE-UNICEF pilot. In addition though, as some of the recommendations go beyond the scope of only the pilot, if adopted, the recommendations also have the potential of in general contributing to enhancing inclusive education practices in Bangladesh.

The most important recommendations made relate to developing DPE’s AT provision process from the one-time activity model it presently represents, to a holistic AT provision service that does not only ensure cost-efficiency, but also long-term support for the children with disabilities in most need of it. To achieve that, teachers would need to be better engaged in the process, among others regularly participating in the preliminary screening for disabilities among their students and referring potential cases to specialized services.

DPE should also ensure that, rather than competing with it, their AT provision model complements other GoB's programs, such as the primary AT provision model through the health care system. A clear share of responsibilities – e.g. DPE limiting itself to providing basic AT, while referring children with more complex needs to health care providers and specialized AT services – would benefit all stakeholders, including those that have the responsibility of implementing DPE's AT provision policy.

Finally, for the implementation of the AT provision policy through schools to truly be successful, all stakeholders that contribute to the process should have the necessary capacity and experience to ensure the children with the most urgent needs are provided with adequate AT. This means that DPE would need to invest in building the capacity of its own administrative staff, but also that of teachers and SLIP Committee and SMC members, through training activities, but also easy-to-understand tools, and guidelines. These should ideally be developed in collaboration with multidisciplinary stakeholders, including education, healthcare, and AT services, as well as representatives of children with disabilities, such as OPDs and child rights organizations.

5.2 Limitations

While there is a significant amount of general literature related to inclusive education policy and praxis in Bangladesh, there is a limited amount specifically related to the practical provision of AT, and none related to the provision of AT through schools. Though the author only utilized literature and resources in English (in addition to a handful of key documents informally translated from Bengali to English using virtual translation software), through the interactions with relevant stakeholders and the information shared during those informal exchanges, the author assesses that no extensive literature on AT provision through schools in Bangladesh is available in Bengali either (or any other language for that matter). The analysis conducted in this thesis relies therefore to a large extent on the intended content of policies, as well as the personal experiences of the author and key stakeholders the author has engaged with throughout the process of the research work.

An additional limitation was the reliance on only secondary data for the analysis, and specifically only such data that was available to the author – both in terms of policies and practices being documented in writing, as well as made available to the public and consequently also the author. The thesis does not hence claim that it has been able to access and utilize all relevant secondary data ever produced on the topic; the author had to foremost rely on secondary data available through online academic databases, as well as such resources which partners and other sector stakeholders had access to and were able to share with the author. Overall, the author would like to flag institutional and programmatic memory as an area of concern that would need to be enhanced in the future, among others, ensuring greater documentation of the sector's work in general, and by making legislation, policies, resources, and other materials (in Bengali and other languages, if available) accessible to the public in especially digital formats. This concern is not limited only to the work conducted by authorities, but also other sector stakeholders, including UN agencies, NGOs, OPDs, academics, and others.

Finally, as it was not possible to do so due to the limited scope of the present thesis, the author would also recommend collecting primary data in future research on this topic, through e.g. the impact assessment proposed as part of the recommendations in the previous chapter. Such data collection should give key stakeholders, including children with disabilities, parents, teachers, school staff, DPE representatives, SLIP and SMC members, doctors, and more, opportunities to share their views and concerns related to present DPE's AT provision model as well as the planned DPE-UNICEF pilot. In addition, DPE and UNICEF should make sure key stakeholders are actively and continuously engaged in every step of the designing, planning, implementation, and evaluation of the planned pilot.

REFERENCES

Action Research (2015) *The Glossary of Education Reform*. Available at: https://www.edglossary.org/action-research/ (Accessed: 19 March 2023).

Allam, F.C. and Martin, M.M. (2021) 'Issues and Challenges in Special Education: A Qualitative Analysis From Teacher's Perspective', *Southeast Asia Early Childhood Journal*, 10(1), pp. 37–49. Available at: https://doi.org/10.37134/saecj.vol10.1.4.2021.

Andrich, R. *et al.* (2013) 'Service Delivery Systems for Assistive Technology in Europe: An AAATE/EASTIN Position Paper', *Technology and Disability*, 25(3), pp. 127–146. Available at: https://doi.org/10.3233/TAD-130381.

Arthur, W.B. (2009) *The Nature of Technology: What It Is and How It Evolves*. New York: Free Press.

Bangladesh Bureau of Statistics (2022a) *National Survey on Persons with Disabilities (NSPD) 2021 - Preliminary Report*.

Bangladesh Bureau of Statistics (2022b) *Population & Housing Census 2022: Preliminary Report*. Dhaka. Available at: https://drive.google.com/file/d/1T0uDswlsJxK3RuBbFZrdecFLIkjCT4UA/view (Accessed: 17 September 2022).

Bangladesh Bureau of Statistics and United Nations Children's Fund (2022) *National Survey on Children's Education in Bangladesh 2021 - Key Findings Report*. Dhaka. Available at: https://bbs.portal.gov.bd/sites/default/files/files/bbs.portal.gov.bd/page/57def76a_aa3c_46e3_9f80_53732eb94a83/2022-07-28-14-44-ac8a8ef499053ffe2379dec9199c4278.pdf (Accessed: 20 September 2022).

Bangladesh Bureau of Statistics and United Nations Children's Fund Bangladesh (2019) *Progotir Pathey Bangladesh, Multiple Indicator Cluster Survey 2019: Survey Findings Report*. Dhaka. Available at: https://mics-surveys-prod.s3.amazonaws.com/MICS6/South%20Asia/Bangladesh/2019/Survey%20findings/Bangladesh%202019%20MICS%20Survey%20Findings_English.pdf (Accessed: 17 September 2022).

Bangladesh Bureau of Statistics and United Nations Children's Fund (UNICEF) (2022) *National Survey on Children's Education in Bangladesh 2021 - Draft Report*. Dhaka.

Bangladesh National Assembly (1990) *Primary Education (Compulsory) Act*. Dhaka: Bangladesh National Assembly. Available at: http://www.commonlii.org/bd/legis/num_act/tpea1990324/ (Accessed: 17 September 2022).

Bangladesh National Assembly (1995) *National Policy on Disability*. Dhaka: Bangladesh National Assembly.

Bangladesh National Assembly (2001) *Persons with Disability Welfare Act*. Dhaka: Bangladesh National Assembly. Available at: http://www.oit.org/dyn/natlex/docs/ELECTRONIC/86291/97310/F2000482408/BGD86291.pdf (Accessed: 17 September 2022).

Bangladesh National Assembly (2013a) *Children Act*. Dhaka: Bangladesh National Assembly. Available at: https://www.unicef.org/bangladesh/sites/unicef.org.bangladesh/files/2018-07/Children%20Act%202013%20English.pdf (Accessed: 17 September 2022).

Bangladesh National Assembly (2013b) *Protection of Persons with Neuro-developmental Disability Trust Act*. Dhaka: Bangladesh National Assembly. Available at: http://www.shuchona.org/wp-content/uploads/2019/02/Neuro-Trust-Act-2013-20-Jan-1.pdf (Accessed: 17 September 2022).

Bangladesh National Assembly (2013c) *Rights and Protection of Persons with Disabilities Act*. Dhaka: Bangladesh National Assembly.

Bangladesh National Assembly (2016) *Draft National Education Act*. Dhaka: Bangladesh National Assembly.

Better Purpose (2023) ‘Webinar: How Can We Best Develop Teachers to Improve Foundational Literacy and Numeracy (FLN)? - Part 1: Pre-Service Teacher Education’. Available at: https://drive.google.com/file/d/1RleI2BKorn50PldQxJZu3cEsGeopQgzh/view (Accessed: 8 April 2023).

Braun, A.M.B. (2020) *Referral and Identification of Special Educational Needs, Global Education Monitoring Report*. Available at: https://unesdoc.unesco.org/ark:/48223/pf0000373657 (Accessed: 9 April 2023).

Brikci, N. and Green, J. (2007) *A Guide to Using Qualitative Research Methodology*. Available at: https://evaluation.msf.org/sites/default/files/2021-12/An%20MSF%20guide%20to%20Using%20Qualitative%20Research%20Methodology.pdf (Accessed: 19 March 2023).

ChatGPT (2023) ‘A Short Poem on Children with Disabilities’ Access to Assistive Technology’.

Choudhury, R.K. *et al.* (2011) *The status of un-served children in education: Children with Disability in Bangladesh*. Dhaka. Available at: https://www.campebd.org/Files/16032014020857pmChildren_with_Disability_in_Bangladesh.pdf (Accessed: 18 September 2022).

Constituent Assembly of Bangladesh (1972) *Constitution of the People’s Republic of Bangladesh*. Dhaka: Constituent Assembly of Bangladesh. Available at: http://bdlaws.minlaw.gov.bd/act-367.html (Accessed: 26 March 2023).

Department of School Education and Literacy (2022) *PRASHAST: A Disability Screening Checklist for Schools (Part-1 and Part-2)*. New Delhi.

Desta, M. *et al.* (2017) ‘Empowering Preschool Teachers to Identify Mental Health Problems: A Task-Sharing Intervention in Ethiopia’, *Mind, Brain, and Education*, 11(1), pp. 32–42. Available at: https://doi.org/10.1111/MBE.12135.

Directorate of Primary Education of Bangladesh (2016) ‘Policy on the Provision of Assistive Devices’. Dhaka.

Directorate of Primary Education of Bangladesh (2018) *Fourth Primary Education Development Program*. Dhaka.

Directorate of Primary Education of Bangladesh (2020) *Education Sector Plan (ESP) for Bangladesh: Fiscal Years 2020/21 – 2024/25*. Dhaka. Available at: https://assets.globalpartnership.org/s3fs-public/document/file/2020-12-Bangladesh-ESP.pdf?VersionId=TUSL9GZrCDLAQ_LXSA5K_293sDcEQKWk (Accessed: 18 September 2022).

Directorate of Primary Education of Bangladesh (2022a) *Annual Primary School Census 2021: Report*. Dhaka. Available at: https://dpe.portal.gov.bd/sites/default/files/files/dpe.portal.gov.bd/publications/46bf0aab_aa24_4515_8d69_bd6e30b0f120/APSC%202021%20Report_31032022%20Latest.pdf (Accessed: 17 September 2022).

Directorate of Primary Education of Bangladesh (2022b) *Special Education Needs and Disabilities Framework*. Directorate of Primary Education of Bangladesh.

Dr. Ahsan, M.T. *et al.* (2019) *End Line Study of the Project Developing a Model of Inclusive Education in Bangladesh (DMIE) Project*. Dhaka.

Dr Grimes, P. *et al.* (2022) *Review of Promising Practices in Early Identification and Intervention for Children with Disabilities in Low- and Middle-Income Countries: Lessons for South Asia (2nd Draft Report)*.

Dr. Nel, H. (2020) *ARTICLE 93: Research Methods for Ph. D. and Master’s Degree Studies: Data Analysis: Part 6 of 7 Parts*, *iNtgrty*. Available at: https://www.intgrty.co.za/tag/inductive-thematic-analysis/ (Accessed: 19 March 2023).

Dron, J. (2021) ‘Educational Technology: What It Is and How It Works’, *AI & Society*, 37(1), pp. 155–166. Available at: https://doi.org/10.1007/S00146-021-01195-Z.

El-Hazmi, M.A.F. (1997) ‘Early Recognition and Intervention for Prevention of Disability and Its Complications’, *La Revue de Santé de la Méditerranée Orientale*, 3(1), pp. 154–161. Available at: https://applications.emro.who.int/emhj/0301/emhj_1997_3_1_154_161.pdf (Accessed: 8 April 2023).

Embrace Action Research (no date) *Creative Educator*. Available at: https://www.thecreativeeducator.com/v07/articles/Embracing_Action_Research (Accessed: 19 March 2023).

Global Cooperation on Assistive Technology (GATE) (2023) ‘GATE Newsletter January - March 2023’, *Global Cooperation on Assistive Technology* [Preprint]. Available at: https://mailchi.mp/mednet-communities/gate-newsletter-jan-mar2023?e=f0174e5259 (Accessed: 21 April 2023).

Gray, C., Wilcox, G. and Nordstokke, D. (2017) ‘Teacher Mental Health, School Climate, Inclusive Education and Student Learning: A Review’, *Canadian Psychology*, 58(3), pp. 203–210. Available at: http://dx.doi.org/10.1037/cap0000117 (Accessed: 8 April 2023).

Grimes, P. and dela Cruz, A. (2021) *Disability-Inclusive Education Practices in Bangladesh*. Kathmandu. Available at: https://www.unicef.org/rosa/media/16986/file/Country%20Profile%20-%20Bangladesh.pdf (Accessed: 17 September 2022).

Handicap International Bangladesh (no date a) *Assistive Technology Manual*.

Handicap International Bangladesh (no date b) *Checklist of Assistive Device Provision*.

Hussein, S.A. and Vostanis, P. (2013) ‘Teacher Training Intervention for Early Identification of Common Child Mental Health Problems in Pakistan’, *Emotional and Behavioural Difficulties* , 18(3), pp. 284–296. Available at: https://doi.org/10.1080/13632752.2013.819254.

Informational Meeting on Experiences with the Child Functioning Module-Teacher Version (2021) *Washington Group on Disability Statistics*. Available at: https://www.washingtongroup-disability.com/events/informational-meeting-on-experiences-with-the-child-functioning-module-teacher-version-539/ (Accessed: 15 April 2023).

‘International Classification of Functioning, Disability and Health (ICF)’ (2021) *World Health Organization (WHO)* [Preprint]. Available at: https://www.who.int/standards/classifications/international-classification-of-functioning-disability-and-health (Accessed: 15 April 2023).

International Organization for Standardization (ISO) (2022) *ISO 9999:2022 - Assistive Products — Classification and Terminology*. Available at: https://www.iso.org/standard/72464.html (Accessed: 2 April 2023).

Joarder, T., Chaudhury, T.Z. and Mannan, I. (2019) ‘Universal Health Coverage in Bangladesh: Activities, Challenges, and Suggestions’, *Advances in Public Health*, 2019, pp. 1–12. Available at: https://doi.org/10.1155/2019/4954095.

Karki, J. *et al.* (2022) ‘Processes of Assistive Technology Service Delivery in Bangladesh, India and Nepal: A Critical Reflection’, *Disability and Rehabilitation: Assistive Technology* [Preprint]. Available at: https://doi.org/10.1080/17483107.2022.2087769.

Khan, N.Z. *et al.* (2018) ‘Scaling Up Child Development Centres in Bangladesh’, *Child: care, health and development*, 44(1), pp. 19–30. Available at: https://doi.org/10.1111/CCH.12530.

Kuroda, K., Kartika, D. and Yuto, K. (2017) *Implications for Teacher Training and Support for Inclusive Education in Cambodia: An Empirical Case Study in a Developing Country*, *JICA Ogata Research Institute*. Available at: https://www.jica.go.jp/jica-ri/publication/workingpaper/wp_148.html (Accessed: 8 April 2023).

Mahlo, D.M. van der M. (2016) 'Defining Inclusive Education, Inclusive Teaching and Inclusive Classrooms', in M. Tsediso M. (ed.) *Inclusive Teaching in South Africa*. 1st edn. African Sun Media, pp. 3–20. Available at: https://doi.org/10.2307/J.CTV1NZFXS4.8.

Male, C. and Wodon, Q.T. (2017) *The Price of Exclusion: Disability and Education: Disability Gaps in Educational Attainment and Literacy*. Washington, D.C. Available at: https://documents.worldbank.org/en/publication/documents-reports/documentdetail/396291511988894028/disability-gaps-in-educational-attainment-and-literacy (Accessed: 15 April 2023).

McCowan, T. (2013) *Education As a Human Right: Principles for a Universal Entitlement to Learning*. 1st edn. Bloomsbury Publishing Plc. Available at: https://ebookcentral.proquest.com/lib/tampere/detail.action?docID=1164276 (Accessed: 18 September 2022).

Mehrin, S.F. *et al.* (2020) 'Adapting an Evidence-Based, Early Childhood Parenting Programme for Integration into Government Primary Health Care Services in Rural Bangladesh', *Frontiers in Public Health*, 8. Available at: https://doi.org/10.3389/FPUBH.2020.608173.

Ministry of Education of Bangladesh (2010) *National Education Policy*. Dhaka. Available at: https://moedu.portal.gov.bd/sites/default/files/files/moedu.portal.gov.bd/page/ad5cfca5_9b1e_4c0c_a4eb_fb1ded9e2fe5/National%20Education%20Policy-English%20corrected%20_2_.pdf (Accessed: 17 September 2022).

Ministry of Education Youth and Sport of Cambodia and Catholic Relief Services (CRS) (2019) *Guideline for Screening Children with Disabilities at Preschool*. Phnom Penh.

Ministry of Finance of Bangladesh and United Nations Bangladesh (2021) *United Nations Sustainable Development Cooperation Framework 2022-2026 - Bangladesh*. Dhaka. Available at: https://www.flipsnack.com/77777E5569B/united-nations-sustainable-development-cooperation-framework/full-view.html (Accessed: 20 September 2022).

Ministry of Primary and Mass Education of Bangladesh and United Nations Children's Fund (UNICEF) (2022) '2022-2023 Rolling Work Plan'. Dhaka.

Mitra, S., Posarac, A. and Vick, B. (2011) *Disability and Poverty in Developing Countries: A Snapshot from the World Health Survey*. Washington, D.C. Available at: https://documents.worldbank.org/en/publication/documents-reports/documentdetail/501871468326189306/disability-and-poverty-in-developing-countries-a-snapshot-from-the-world-health-survey (Accessed: 15 April 2023).

Nilholm, C. (2021) ‘Research About Inclusive Education in 2020 – How Can We Improve Our Theories in Order to Change Practice?’, *European Journal of Special Needs Education*, 36(3), pp. 358–370. Available at: https://doi.org/10.1080/08856257.2020.1754547.

Oldfrey, B. *et al.* (2021) ‘Could Assistive Technology Provision Models Help Pave the Way for More Environmentally Sustainable Models of Product Design, Manufacture and Service in a Post-COVID World?’, *Sustainability*, 13(19), p. 10867. Available at: https://doi.org/10.3390/SU131910867.

Oliver, D. (2021) *‘I am not ashamed’: Disability advocates, experts implore you to stop saying ‘special needs’*, *USA Today*. Available at: ‘I am not ashamed’: Disability advocates, experts implore you to stop saying ‘special needs’ (Accessed: 25 March 2023).

Organisation for Economic Co-operation and Development (OECD) (2004) *Equity in Education: Students with Disabilities, Learning Difficulties and Disadvantages*, *Equity in Education: Students with Disabilities, Learning Difficulties and Disadvantages*. Organisation for Economic Cooperation and Development (OECD). Available at: https://doi.org/10.1787/9789264103702-EN.

Organisation for Economic Co-operation and Development (OECD) (2007) *Students with Disabilities, Learning difficulties and Disadvantages: Policies, Statistics and Indicators*. Paris. Available at: https://www.oecd.org/education/innovation-education/studentswithdisabilitieslearningdifficultiesanddisadvantagespoliciesstatisticsandindicators-2007edition.htm (Accessed: 9 April 2023).

Schuelka, M.J. (2015) ‘The Evolving Construction and Conceptualisation of “Disability” in Bhutan’, *Disability and Society*, 30(6), pp. 820–833. Available at: https://doi.org/10.1080/09687599.2015.1052043.

Shah, H. and Kumar, D. (2012) ‘Sensitizing the Teachers Towards School Mental Health Issues: An Indian Experience’, *Community Mental Health*, 48(4), pp. 522–526. Available at: https://doi.org/10.1007/S10597-011-9437-2.

Singh, K. (2010) ‘Right to Basic Education and State Responsibility’, *International Journal of Educational Reform*, 19(2), pp. 86–106. Available at: https://doi.org/10.1177/105678791001900202.

Social Model of Disability (no date) *People with Disability Australia*. Available at: https://pwd.org.au/resources/models-of-disability/ (Accessed: 25 March 2023).

Sonnander, K. (2000) ‘Early Identification of Children with Developmental Disabilities’, *Acta Paediatrica, International Journal of Paediatrics, Supplement*, 89(434), pp. 17–23. Available at: https://doi.org/10.1111/j.1651-2227.2000.tb03091.x.

Sosiaali- ja terveysministeriö (2018) *Valtakunnalliset Lääkinnällisen Kuntoutuksen Apuvälineiden Luovutusperusteet: Opas Apuvälinetyötä Tekeville Ammattilaisille ja Ohjeita Asiakkaille*. Helsinki. Available at: https://julkaisut.valtioneuvosto.fi/handle/10024/161068 (Accessed: 8 April 2023).

Sprunt, B. *et al.* (2019) 'Validating the UNICEF/Washington Group Child Functioning Module for Fijian Schools to Identify Seeing, Hearing and Walking Difficulties', *Disability and Rehabilitation*, 41(2), pp. 201–211. Available at: https://doi.org/10.1080/09638288.2017.1378929.

Steps to Assistive Technology Provision (no date) *Physiopedia*. Available at: https://www.physio-pedia.com/Steps_to_Assistive_Technology_Provision (Accessed: 21 April 2023).

Talmor, R., Reiter, S. and Feigin, N. (2005) 'Factors Relating to Regular Education Teacher Burnout in Inclusive Education', *European Journal of Special Needs Education*, 20(2), pp. 215–229. Available at: https://doi.org/10.1080/08856250500298012.

Taweechaisupapong, M. (2015) *Teachers' Views About Teacher Training Towards Inclusive Education*. University of Oslo. Available at: https://www.duo.uio.no/bitstream/handle/10852/53126/1/MONTIRA-TAWEECHAISUPAPONG-Dissertation-Module-15-11-20.pdf (Accessed: 8 April 2023).

The Office of the High Commissioner for Human Rights (OHCHR) (no date) *Ratification Status for CRC - Convention on the Rights of the Child*. Available at: https://tbinternet.ohchr.org/_layouts/15/TreatyBodyExternal/Treaty.aspx?Treaty=CRC&Lang=en (Accessed: 25 March 2023).

The Salamanca Statement and Framework for Action on Special Needs Education (1994). Salamanca: World Conference on Special Needs Education: Access and Quality. Available at: https://unesdoc.unesco.org/ark:/48223/pf0000098427 (Accessed: 26 March 2023).

UNESCO Institute for Statistics (UIS) (2018) *Information Paper N. 49: Education and Disability: Analysis of Data from 49 Countries*.

UNESCO Institute for Statistics (UIS) (2019) *New Methodology Shows that 258 Million Children, Adolescents and Youth Are Out of School*. Available at: https://uis.unesco.org/sites/default/files/documents/new-methodology-shows-258-million-children-adolescents-and-youth-are-out-school.pdf (Accessed: 26 March 2023).

United Nations Children's Fund (UNICEF) (2021a) 'Country Programme Document: Bangladesh', *Executive Board: Second Regular Session 2021* [Preprint]. United Nations Economic and Social Council . Available at: https://www.unicef.org/executiveboard/media/6941/file/2021-PL26-Bangladesh_CPD-EN-ODS.pdf (Accessed: 17 January 2023).

United Nations Children’s Fund (UNICEF) (2021b) *Seen, Counted, Included: Using Data to Shed Light on the Well-Being of Children with Disabilities*. New York. Available at: https://data.unicef.org/wp-content/uploads/2022/12/Disabilities-Report_11_30.pdf (Accessed: 26 March 2023).

United Nations Children’s Fund (UNICEF) (no date) *Inclusive Education: Every Child Has the Right to Quality Education and Learning*, *United Nations Children’s Fund*. Available at: https://www.unicef.org/education/inclusive-education (Accessed: 26 March 2023).

United Nations Educational Scientific and Cultural Organization (UNESCO) (2020) *Global Education Monitoring Report 2020: Inclusion and Education: All Means All*. Paris. Available at: https://reliefweb.int/report/world/global-education-monitoring-report-2020-inclusion-and-education-all-means-all?gclid=Cj0KCQjwwtWgBhDhARIsAEMcxeDfMv3IIlfqVWEFDZkxMNuC-gy-5U2QCIs5kniJVQpu2t5LOfXIICAaAtWBEALw_wcB (Accessed: 18 March 2023).

United Nations Educational Scientific and Cultural Organization (UNESCO) (2013) *What You Need to Know About Inclusion in Education*, *United Nations Educational, Scientific and Cultural Organization (UNESCO)*. Available at: https://www.unesco.org/en/inclusion-education/need-know#how-does-inclusion-relate-to-the-right-to-education- (Accessed: 26 March 2023).

United Nations Educational Scientific and Cultural Organization (UNESCO) (2020) *Global Education Monitoring Report 2020: Inclusion and Education: All Means All*. Paris: UNESCO. Available at: https://doi.org/10.54676/JJNK6989.
United Nations General Assembly (1948) *Universal Declaration of Human Rights*. Paris: United Nations General Assembly. Available at: https://www.un.org/en/about-us/universal-declaration-of-human-rights (Accessed: 25 March 2023).

United Nations General Assembly (1989) *Convention on the Rights of the Child*. New York: United Nations General Assembly. Available at: https://www.ohchr.org/en/instruments-mechanisms/instruments/convention-rights-child (Accessed: 25 March 2023).

United Nations General Assembly (2006) *Convention on the Rights of Persons with Disabilities*. New York: United Nations General Assembly. Available at: https://social.desa.un.org/issues/disability/crpd/convention-on-the-rights-of-persons-with-disabilities-crpd (Accessed: 25 March 2023).

United Nations General Assembly (2015) ‘Transforming Our World: the 2030 Agenda for Sustainable Development’. Available at: https://documents-dds-ny.un.org/doc/UNDOC/GEN/N15/291/89/PDF/N1529189.pdf?OpenElement (Accessed: 18 January 2023).

Valjakka, S. *et al.* (2022) *‘Paperilla Lapsi Saa Tukea, Käytännössä Ei’: Vammaisten ja Toimintarajoitteisten Lasten Vanhempien Kokemuksia Oppimisen ja Koulunkäynnin Tuen Toteutumisesta*. Available at: https://vammaisfoorumi.fi/wp-content/uploads/2022/10/Vammaisfoorumn-koulukyselyn-raportti.pdf (Accessed: 15 April 2023).

Warnes, E., Done, E.J. and Knowler, H. (2021) ‘Mainstream Teachers’ Concerns About Inclusive Education for Children with Special Educational Needs and Disability in England Under Pre-pandemic Conditions’, *Journal of Research in Special Educational Needs*, 22(1), pp. 31–43. Available at: https://doi.org/10.1111/1471-3802.12525.

Washington Group of Disability Statistics and United Nations Children’s Fund (UNICEF) (2017) *UNICEF/ Washington Group on Disability Statistics Module on Child Functioning*. Available at: https://data.unicef.org/wp-content/uploads/2017/03/UNICEF-WG-Module-on-Child-Functioning-Concept-Note.pdf (Accessed: 15 April 2023).

Washington Group on Disability Statistics and United Nations Children’s Fund (UNICEF) (2022) ‘Module on Child Functioning: Questionnaires’, *UNICEF* [Preprint]. Available at: https://data.unicef.org/resources/module-child-functioning/ (Accessed: 15 April 2023).

WG/UNICEF Inclusive Education Module (IEM) (no date) *The Washington Group on Disability Statistics*. Available at: https://www.washingtongroup-disability.com/question-sets/wg-unicef-inclusive-education-module-iem/ (Accessed: 15 April 2023).

World Declaration on Education for All and Framework for Action to Meet Basic Learning Needs (1990). Jomtien: World Conference on Education for All: Meeting Basic Learning Needs. Available at: https://unesdoc.unesco.org/ark:/48223/pf0000127583 (Accessed: 25 March 2023).

World Health Organization (WHO) (2016) *Priority Assistive Products List: Improving Access to Assistive Technology for Everyone, Everywhere*. Geneva. Available at: https://apps.who.int/iris/rest/bitstreams/920804/retrieve (Accessed: 1 April 2023).

World Health Organization (WHO) and United Nations Children’s Fund (UNICEF) (2020) *A Manual for Public Procurement of Assistive Products, Accessories, Spare Parts, and Related Services*. Geneva. Available at: https://apps.who.int/iris/rest/bitstreams/1352084/retrieve (Accessed: 21 April 2023).

World Health Organization (WHO) and United Nations Children’s Fund (UNICEF) (2022) *Global Report on Assistive Technology*. Geneva.

World Health Organization (WHO) and World Bank (2011) *World Report on Disability*. Geneva. Available at: https://apps.who.int/iris/rest/bitstreams/53067/retrieve (Accessed: 17 September 2022).

APPENDICES

Appendix 1. Priority Assistive Products List (WHO, 2016, pp. 4–7)

1. Alarm signallers with light/sound/vibration
2. Audioplayers with DAISY capability
3. Braille displays (note takers)
4. Braille writing equipment/braillers
5. Canes/sticks
6. Chairs for shower/bath/toilet
7. Closed captioning displays
8. Club foot braces
9. Communication boards/books/cards
10. Communication software
11. Crutches, axillary/elbow
12. Deafblind communicators
13. Fall detectors
14. Gesture to voice technology
15. Global positioning system (GPS) locators
16. Hand rails/grab bars
17. Hearing aids (digital) and batteries
18. Hearing loops/FM systems
19. Incontinence products, absorbent
20. Keyboard and mouse emulation software
21. Magnifiers, digital hand-held
22. Magnifiers, optical
23. Orthoses, lower limb
24. Orthoses, spinal

25 **Orthoses, upper limb**

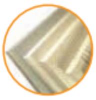
26 **Personal digital assistant (PDA)**

27 **Personal emergency alarm systems**

28 **Pill organizers**

29 **Pressure relief cushions**

30 **Pressure relief mattresses**



31 **Prostheses, lower limb**

32 **Ramps, portable**

33 **Recorders**

34 **Rollators**

35 **Screen readers**

36 **Simplified mobile phones**

37 **Spectacles; low vision, short distance, long distance, filters and protection**

38 **Standing frames, adjustable**

39 **Therapeutic footwear; diabetic, neuropathic, orthopaedic**

40 **Time management products**

41 **Travel aids, portable**

42 **Tricycles**

43 **Video communication devices**

44 **Walking frames/ walkers**

45 **Watches, talking/ touching**

46 **Wheelchairs, manual for active use**

47 **Wheelchairs, manual assistant-controlled**

48 **Wheelchairs, manual with postural support**

49 **Wheelchairs, electrically powered**

50 **White canes**

Appendix 2. WG and UNICEF Child Functioning Module (Age 5-17) (WG and UNICEF, 2022)

CHILD FUNCTIONING (AGE 5-17)		**CF**
CF1. I WOULD LIKE TO ASK YOU SOME QUESTIONS ABOUT DIFFICULTIES YOUR CHILD MAY HAVE. DOES (*name*) WEAR GLASSES OR CONTACT LENSES?	Yes .... 1 No....................................... 2	 2⇨CF3
CF2. WHEN WEARING HIS/HER GLASSES OR CONTACT LENSES, DOES (*name*) HAVE DIFFICULTY SEEING? WOULD YOU SAY (*name*) HAS: NO DIFFICULTY, SOME DIFFICULTY, A LOT OF DIFFICULTY OR CANNOT DO AT ALL?	No difficulty......................... 1 Some difficulty .... 2 A lot of difficulty .... 3 Cannot do at all 4	1⇨CF4 2⇨CF4 3⇨CF4 4⇨CF4
CF3. DOES (*name*) HAVE DIFFICULTY SEEING? WOULD YOU SAY (*name*) HAS: NO DIFFICULTY, SOME DIFFICULTY, A LOT OF DIFFICULTY OR CANNOT DO AT ALL?	No difficulty......................... 1 Some difficulty .... 2 A lot of difficulty .... 3 Cannot do at all 4	
CF4. DOES (*name*) USE A HEARING AID?	Yes .... 1 No....................................... 2	 2⇨CF6
CF5. WHEN USING HIS/HER HEARING AID, DOES (*name*) HAVE DIFFICULTY HEARING SOUNDS LIKE PEOPLE'S VOICES OR MUSIC? WOULD YOU SAY (*name*) HAS: NO DIFFICULTY, SOME DIFFICULTY, A LOT OF DIFFICULTY OR CANNOT DO AT ALL?	No difficulty......................... 1 Some difficulty .... 2 A lot of difficulty .... 3 Cannot do at all 4	1⇨CF7 2⇨CF7 3⇨CF7 4⇨CF7
CF6. DOES (*name*) HAVE DIFFICULTY HEARING SOUNDS LIKE PEOPLE'S VOICES OR MUSIC? WOULD YOU SAY (*name*) HAS: NO DIFFICULTY, SOME DIFFICULTY, A LOT OF DIFFICULTY OR CANNOT DO AT ALL?	No difficulty......................... 1 Some difficulty .... 2 A lot of difficulty .... 3 Cannot do at all 4	
CF7. DOES (*name*) USE ANY EQUIPMENT OR RECEIVE ASSISTANCE FOR WALKING?	Yes .... 1 No....................................... 2	 2⇨CF12

CF8. WITHOUT HIS/HER EQUIPMENT OR ASSISTANCE, DOES (*name*) HAVE DIFFICULTY WALKING 100 YARDS/METERS ON LEVEL GROUND? THAT WOULD BE ABOUT THE LENGTH OF 1 FOOTBALL FIELD. [OR INSERT COUNTRY SPECIFIC EXAMPLE]. WOULD YOU SAY (*name*) HAS: SOME DIFFICULTY, A LOT OF DIFFICULTY OR CANNOT DO AT ALL?	Some difficulty .... 2 A lot of difficulty .... 3 Cannot do at all 4	 3⇨CF10 4⇨CF10
CF9. WITHOUT HIS/HER EQUIPMENT OR ASSISTANCE, DOES (*name*) HAVE DIFFICULTY WALKING 500 YARDS/METERS ON LEVEL GROUND? THAT WOULD BE ABOUT THE LENGTH OF 5 FOOTBALL FIELDS. [OR INSERT COUNTRY SPECIFIC EXAMPLE]. WOULD YOU SAY (*name*) HAS: SOME DIFFICULTY, A LOT OF DIFFICULTY OR CANNOT DO AT ALL?	Some difficulty .... 2 A lot of difficulty .... 3 Cannot do at all 4	
CF10. WITH HIS/HER EQUIPMENT OR ASSISTANCE, DOES (*name*) HAVE DIFFICULTY WALKING 100 YARDS/METERS ON LEVEL GROUND? THAT WOULD BE ABOUT THE LENGTH OF 1 FOOTBALL FIELD. [OR INSERT COUNTRY SPECIFIC EXAMPLE]. WOULD YOU SAY (*name*) HAS: NO DIFFICULTY, SOME DIFFICULTY, A LOT OF DIFFICULTY OR CANNOT DO AT ALL?	No difficulty......................... 1 Some difficulty .... 2 A lot of difficulty .... 3 Cannot do at all 4	 3⇨CF14 4⇨CF14
CF11. WITH HIS/HER EQUIPMENT OR ASSISTANCE, DOES (*name*) HAVE DIFFICULTY WALKING 500 YARDS/METERS ON LEVEL GROUND? THAT WOULD BE ABOUT THE LENGTH OF 5 FOOTBALL FIELDS. [OR INSERT COUNTRY SPECIFIC EXAMPLE]. WOULD YOU SAY (*name*) HAS: NO DIFFICULTY, SOME DIFFICULTY, A	No difficulty......................... 1 Some difficulty .... 2 A lot of difficulty .... 3 Cannot do at all 4	1⇨CF14 2⇨CF14 3⇨CF14 4⇨CF14

LOT OF DIFFICULTY OR CANNOT DO AT ALL?		
CF12. COMPARED WITH CHILDREN OF THE SAME AGE, DOES (*name*) HAVE DIFFICULTY WALKING 100 YARDS/METERS ON LEVEL GROUND? THAT WOULD BE ABOUT THE LENGTH OF 1 FOOTBALL FIELD. [OR INSERT COUNTRY SPECIFIC EXAMPLE]. WOULD YOU SAY (*name*) HAS: NO DIFFICULTY, SOME DIFFICULTY, A LOT OF DIFFICULTY OR CANNOT DO AT ALL?	No difficulty......................... 1 Some difficulty .... 2 A lot of difficulty .... 3 Cannot do at all 4	 3⇨CF14 4⇨CF14
CF13. COMPARED WITH CHILDREN OF THE SAME AGE, DOES (*name*) HAVE DIFFICULTY WALKING 500 YARDS/METERS ON LEVEL GROUND? THAT WOULD BE ABOUT THE LENGTH OF 5 FOOTBALL FIELDS. [OR INSERT COUNTRY SPECIFIC EXAMPLE]. WOULD YOU SAY (*name*) HAS: NO DIFFICULTY, SOME DIFFICULTY, A LOT OF DIFFICULTY OR CANNOT DO AT ALL?	No difficulty......................... 1 Some difficulty .... 2 A lot of difficulty .... 3 Cannot do at all 4	
CF14. DOES (*name*) HAVE DIFFICULTY WITH SELF-CARE SUCH AS FEEDING OR DRESSING HIM/HERSELF? WOULD YOU SAY (*name*) HAS: NO DIFFICULTY, SOME DIFFICULTY, A LOT OF DIFFICULTY OR CANNOT DO AT ALL?	No difficulty......................... 1 Some difficulty .... 2 A lot of difficulty .... 3 Cannot do at all 4	
CF15. WHEN (*name*) SPEAKS, DOES HE/SHE HAVE DIFFICULTY BEING UNDERSTOOD BY PEOPLE INSIDE OF THIS HOUSEHOLD? WOULD YOU SAY (*name*) HAS: NO DIFFICULTY, SOME DIFFICULTY, A LOT OF DIFFICULTY OR CANNOT DO AT ALL?	No difficulty......................... 1 Some difficulty .... 2 A lot of difficulty .... 3 Cannot do at all 4	

CF16. WHEN (*name*) SPEAKS, DOES HE/SHE HAVE DIFFICULTY BEING UNDERSTOOD BY PEOPLE OUTSIDE OF THIS HOUSEHOLD? WOULD YOU SAY (*name*) HAS: NO DIFFICULTY, SOME DIFFICULTY, A LOT OF DIFFICULTY OR CANNOT DO AT ALL?	No difficulty .... 1 Some difficulty .... 2 A lot of difficulty .... 3 Cannot do at all 4	
CF17. COMPARED WITH CHILDREN OF THE SAME AGE, DOES (*name*) HAVE DIFFICULTY LEARNING THINGS? WOULD YOU SAY (*name*) HAS: NO DIFFICULTY, SOME DIFFICULTY, A LOT OF DIFFICULTY OR CANNOT DO AT ALL?	No difficulty .... 1 Some difficulty .... 2 A lot of difficulty .... 3 Cannot do at all 4	
CF18. COMPARED WITH CHILDREN OF THE SAME AGE, DOES (*name*) HAVE DIFFICULTY REMEMBERING THINGS? WOULD YOU SAY (*name*) HAS: NO DIFFICULTY, SOME DIFFICULTY, A LOT OF DIFFICULTY OR CANNOT DO AT ALL?	No difficulty .... 1 Some difficulty .... 2 A lot of difficulty .... 3 Cannot do at all 4	
CF19. DOES (*name*) HAVE DIFFICULTY CONCENTRATING ON AN ACTIVITY THAT HE/SHE ENJOYS DOING? WOULD YOU SAY (*name*) HAS: NO DIFFICULTY, SOME DIFFICULTY, A LOT OF DIFFICULTY OR CANNOT DO AT ALL?	No difficulty .... 1 Some difficulty .... 2 A lot of difficulty .... 3 Cannot do at all 4	
CF20. DOES (*name*) HAVE DIFFICULTY ACCEPTING CHANGES IN HIS/HER ROUTINE? WOULD YOU SAY (*name*) HAS: NO DIFFICULTY, SOME DIFFICULTY, A LOT OF DIFFICULTY OR CANNOT DO AT ALL?	No difficulty .... 1 Some difficulty .... 2 A lot of difficulty .... 3 Cannot do at all 4	
CF21. COMPARED WITH CHILDREN OF THE SAME AGE, DOES (*name*) HAVE DIFFICULTY CONTROLLING HIS/HER BEHAVIOUR?	No difficulty .... 1 Some difficulty .... 2 A lot of difficulty .... 3 Cannot do at all 4	

WOULD YOU SAY (*name*) HAS: NO DIFFICULTY, SOME DIFFICULTY, A LOT OF DIFFICULTY OR CANNOT DO AT ALL?		
CF22. DOES (*name*) HAVE DIFFICULTY MAKING FRIENDS? WOULD YOU SAY (*name*) HAS: NO DIFFICULTY, SOME DIFFICULTY, A LOT OF DIFFICULTY OR CANNOT DO AT ALL?	No difficulty......................... 1 Some difficulty .... 2 A lot of difficulty .... 3 Cannot do at all 4	
CF23. HOW OFTEN DOES (*name*) SEEM VERY ANXIOUS, NERVOUS OR WORRIED? WOULD YOU SAY: DAILY, WEEKLY, MONTHLY, A FEW TIMES A YEAR OR NEVER?	Daily .... 1 Weekly................................ 2 Monthly............................... 3 A few times a year............. 4 Never.................................. 5	
CF24. HOW OFTEN DOES (*name*) SEEM VERY SAD OR DEPRESSED? WOULD YOU SAY: DAILY, WEEKLY, MONTHLY, A FEW TIMES A YEAR OR NEVER?	Daily .... 1 Weekly................................ 2 Monthly............................... 3 A few times a year............. 4 Never.................................. 5	

Appendix 3. Steps of Assistive Device Provision (Handicap International Bangladesh, no date a, pp. 104–105)

Before AD Provision:

1. **Assessment: complete in-depth assessment; please recheck that following information is coming from assessment**

- Personal/demographic/family information
- Disability history
- Personal goal / expectations
- Previous use of assistive device including identification of any barriers and facilitating factors
- Accessibility (at home, in the community, to workplace/school)
- Assessment of physical, intellectual, sensory and mental health status
- Assessment of function including activities of daily living

2. **Needs identification, device selection, measurement, order form**

- Identify the needs of assistive device based on assessment
- Take proper measurement for assistive device; use assistive device guide manual as reference
- Ensure proper recording on assistive device order form: form should record the **ACTUAL SIZE OF REQUIRED ASSISTIVE DEVICE not true size of the person with disability**

3. **Rehabilitation, trial, preparatory follow up advice**

- Start rehabilitation program in preparation for receiving assistive device
- If possible, trial via an assessment assistive device (i.e. try a wheelchair, crutches, corner seat, etc.)
- If they are able to encourage the person with disability and/or their family to buy the assistive device themselves, it will create ownership
- **Please recheck**: The person being assessed and/or care giver understands the need and usefulness of the selected assistive device.
- Discuss the necessity of assistive device repair, maintenance, and link with workshop or local mechanics/ workshop.
- Discuss that needs will change over time which lead to need for review, identify source for review for after completion of project cycle eg CHDRP

at local CDO so that the person with disability knows where to go for assistance; **N.B. children:**
  - Developmental needs and appropriate assistive device needs will change over time
  - Children will outgrow assistive devices which will then need to be modified or replaced
- Find if there is any local way to make the assistive device, maintain and repair or is it feasible to train local people (consider of quality and local availability of materials)

During AD Production:

4. **Monitor production, advise re accessibility**

- Try to develop linkage between assistive device workshop and person with disability or local CDO/NGO
- Follow-up assistive device at workshop (local/Dhaka) during production
- Cross-check with measurement and actual production
- Support and advise re appropriate home modification/accessibility issues

During AD Provision (center based):

5. **Centre based orientation, follow up, rehabilitation**

- Complete any adjustments or modification required to ensure fit, clinical and functional needs addressed
- Complete any specialized adjustments e.g. hearing aid frequency
- Give orientation of assistive device use e.g. for Wheelchair: How to propel, transfer or break; Hearing Aid: How to check the battery, off-on, etc.
- Refer for any follow up/conduct joint distribution for specialized devices e.g. speech and language therapist for hearing aids
- Orient with warning signs i.e. for orthosis/prosthesis/wheelchair: sign of pressure sore
- Provide with referral details for specialized follow up e.g. P&O
- Provide advice re hygiene, health and safety i.e. washing and drying orthosis, wheelchair cushion, liner for prosthesis, stump sock
- Orient with different parts of the assistive device and its purpose

- Provide advice on routine maintenance and repair
- Provide rehabilitation plan to ensure optimum potential reached with assistive device
- Orient with indicators that a child has outgrown assistive device/ developmental needs have changed and reinforce how to secure review: identify local source of support e.g. CHDRP
- **Please recheck**: The person being assessed and/or care giver understands the need and usefulness of the selected assistive device.

After AD Provision (Home based follow-up):

6. **Rehabilitation, accessibility, function, inclusion**

- Please recheck: the person being assessed and/or care giver understands the need and usefulness of the selected assistive device; assess actual benefit in home/school/work environment.
- Reinforce and illustrate functional role of assistive in actual environment
- Set long term rehabilitation plan; perform in partnership with person with disability, care giver and local CHDRP for ongoing support (if possible)
- Facilitate further accessibility /home modification, perform any additional AD modification/adaptation
- Develop link with ADL, Livelihood, Schooling (this may require several visit/linking with local CHDRP)
- Link with workshop or local mechanics/ workshop for repairs.
- Reinforce maintenance issues
- Reinforce needs will change over time which lead to need for review, identify source for review for after completion of project cycle e.g. CHDRP at local CDO so that the person with disability knows where to go for assistance; **N.B. children**:
    - Developmental needs and appropriate assistive device needs will change over time
    - Children will outgrow assistive devices which will then need to be modified or replaced

Appendix 4. Checklist of Assistive Device Provision (Handicap International Bangladesh, no date b)

Name of the person who is being assessed/receiving AD:
Address (+ Contact Number):
Ref no:
Type of disability: HI ( ) HI&SI ( ) VI ( ) PD ( ) ID ( ) MI ( ) MD ( ) ASD ( )
Type of AD: Organization ordered from: Date AD received:

SL #	**Activity**	**Monitoring**	**If no, why Or any remarks**
	During Assistive Device Assessment		
1	Multi-disciplinary Team form is completed with all relevant information	☐ Yes ☐ No	
2	Measurement of AD taken with ACTUAL SIZE of required AD (not the body size) by using AD measurement form	☐ Yes ☐ No	
3	Trial via an assessment AD (if possible)	☐ Yes ☐ No	
4	Person with disability, family &/caregiver identify the need and importance of AD	☐ Yes ☐ No	
5	Person with disability and/or family is aware about the need of repair, maintenance of AD	☐ Yes ☐ No	
6	Person with disability and/or family are aware about the change the need of AD over time	☐ Yes ☐ No	
7	Person with disability and/or family are aware about the local way to make the AD	☐ Yes ☐ No	

8	Person with disability and/or family member are encouraged to buy AD independently	☐ Yes ☐ No	Outcome:

During Assistive Device Production			
9	Develop linkage between AD workshop and person with disability & / partner NGO	☐ Yes ☐ No	
10	Technical staff follow-up of AD at workshop during its production (To facilitate adaptation, monitor the measurement are following)	☐ Yes ☐ No	
11	Support/facilitate appropriate accessibility (i.e. Home, community, school/ workplace)	☐ Yes ☐ No	
12	Rehabilitation services initiated to maximize functional usefulness of AD	☐ Yes ☐ No	

During Assistive Device Provision			
13	Give orientation of the use of AD during provision of AD	☐ Yes ☐ No	
14	Complete any adjustments and modifications e.g. wheelchair footplate height, straps for special seat, etc.	☐ Yes ☐ No	
15	Orient with warning/ danger sign i.e. pressure sore	☐ Yes ☐ No	
16	Orient with hygiene health and safety for the assistive device (i.e. some AD need to wash and dry)	☐ Yes ☐ No	

17	Refer for any follow up/conduct joint distribution for specialized devices eg speech and language therapist for hearing aids	☐ Yes ☐ No	
18	Orient with different parts of the AD and how routinely maintenance and repair	☐ Yes ☐ No	
19	Provide rehabilitation plan to ensure optimum potential reached with AD	☐ Yes ☐ No	
20	Orient with indicators that a child has outgrown assistive device/ developmental needs have changed and reinforce how to secure review: identify local source of support e.g. CHDRP	☐ Yes ☐ No	

After Provision of Assistive Device			
21	Reinforce and illustrate functional role of AD in actual environment	☐ Yes ☐ No	
22	Facilitate further accessibility /home modification, perform any additional AD modification/adaptation	☐ Yes ☐ No	
23	Set long term rehabilitation plan; perform in partnership with person with disability, care giver and local CHDRP for ongoing support (if possible)	☐ Yes ☐ No	
24	Develop link with ADL, Livelihood, Schooling (this may	☐ Yes ☐ No	

	require several visit/linking with local CHDRP)		
25	Link with workshop or local mechanics/ workshop for repairs	☐ Yes ☐ No	
26	AD monitoring form is completed with time interval	☐ Yes ☐ No	

Any comments/ remarks: