Assistive Technology: Shaping a Sustainable and Inclusive World
D. Archambault and G. Kouroupetroglou (Eds.)
IOS Press, 2023

doi:10.3233/SHTI230632

Unpacking 'What Works': A Commentary of the Key Learnings for ICT from the AT2030 Program

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Abstract. The AT2030 programme was launched in 2018 to test 'what works' in getting assistive technology (AT) to people globally, specifically in low-and middle-income countries (LMIC), where there is often a systematic lack of provision. After four years, this paper reviews the project outcomes, focussing on published material. It provides the backdrop to the AT2030 program, contextualises current developments in global AT global and funding, and unpacks the key learnings of what works to get AT to the people that need it around the world, with a focus on ICT. The paper does this by applying Global Disability Innovation Hub's mission-led and transformative approach, concluding with contemporary actions to improve access to AT to illustrate the value of embracing complexity for AT ecosystem stakeholders, including researchers, practitioners, AT users and policymakers.

Keywords scale, access, assistive technology, innovation, disability, ICT

1. Introduction

Humans have used technologies for millennia, and the role of technology in enabling human outcomes is well established. There is ample evidence that when assistive technology is provided in a timely way, and the assistive products and training are delivered well, there is a positive impact on the AT user. Despite this, a huge global unmet need still exists for millions of people. The impact of fit-for-purpose assistive technology in narrowing the capability gap [1] between person and environment, particularly where environmental barriers and human diversity prevent access, is also becoming progressively clearer as the evidence base improves. Rapid demographic

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changes (such as an ageing population and increases in humanitarian situations), as well as exponential growth in technologies themselves, have led to a 'tipping point' in unmet Assistive Technology (AT) need, that is, products and services which optimise functioning and reduce the experience of disability [2]. So, some key questions arise – What works in getting AT to people?, What systemic barriers must be overcome, and what innovations can help unlock the provisioning potential?

1.1. Contemporary actions to improve access to AT

Global actions, such as the AT2030 programme, are underway to enable access to AT for those who need it. The 71st World Health Assembly (WHA) adopted resolution WHA71.8 on 26 May 2018, which urges all Member States to take action to improve access to assistive technology. The resolution resulted from much hard work by many organisations. The road to this point was well summarised by Layton et al. [3], which establishes the road to the development of coherence across the multiple actors who have helped pave the way for the resolution. Notably, the GATE community, international Assistive Technology Associations (which later became GAATO) (www.gaato.org) and ATscale, Global Partnership for Assistive Technology (www.atscale.com) [3]. Within this global actor-network, Global Disability Innovation Hub (GDI Hub) (www.disabilityinnovation.com) – a research and practice centre – which leads the AT2030 program, takes a disability justice approach to developing a fairer world, asking questions such as assistive technology for what? [4] and ensuring research and practice look at the necessary AT policies and practices, and that the global disability innovation movement focuses simultaneously on removing stigma and discrimination [5].

This paper reports findings from the 'what works' project focusing on Information and Communication Technologies (ICT). For this, we have used the ISO9999 standard [2] (assistive products - classification and terminology) to pull out key learnings from the 'what works' project within the AT2030 programme and use ICT as an exemplary learning area from this corpus of work. First, we explain in more detail the AT2030 program: its purpose, history and framing.

1.2 The AT2030 programme and paradigm shift

In 2018 the UK Foreign, Commonwealth and Development Office (FCDO) awarded a £10m grant from the UK government to run a three-year, multi-partner programme called 'AT:2030 – Life Changing Assistive Technology for All'. AT2030 is designed to trial and test 'what works' to improve access to life-changing AT for all. Due to its success, the UK Government doubled its investment in 2019 to £19.8 million. The partnership has match funded that investment to take the programme to £40m. AT2030 supported the development of the WHO/UNICEF Global Report on AT in 2022 alongside ATscale. The AT2030 programme operates with many partners, including multinational institutions (e.g. WHO, UNICEF, Clinton Health Access Initiative, ATscale), academic partners (e.g. London School of Hygiene and Tropical Medicine, Assisted Living and Learning Institute, University of Maynooth, University of Nairobi) and local partners (Kilimanjaro Blind Trust Association, Sierra Leone Urban Research Centre and Motivation). The insights for AT2030 are being synthesized by the WHO Global Collaborating Centre on Assistive Technology, based in the Academic Research Centre (ARC) arm of GDI Hub at University College London (UCL).

AT2030 comprises four programme clusters – designed to test innovative approaches to AT provision to increase access; which were co-designed between the core partners, the funder and the ATscale forming committee in 2018, following a scoping report [5] setting out the core market failure issues. These are **Data & Evidence** – improving data and evidence to enable better decision-making and to unlock investment into AT, including in humanitarian contexts; **Innovation** – sparking innovation and supporting new products and service delivery models to scale access to AT; **Country Implementation** – laying the foundations for market shaping and systems-level change; driving the availability and affordability of AT; opening up market access and building country capacity; and **Capacity & Participation** – building partnerships, capacity and community solutions, maximizing the power of the Paralympics to overcome stigma and promoting inclusive design. The clusters represent the social justice lens applied by GDI Hub whilst ensuring the necessary systems-thinking and market-shaping pathways are supported and evidenced. Twelve sub-programmes are housed within (and across) these four main clusters.

1.3. The case of information and communication technologies (ICT)

ICT is responsible for a wide range of possible AT – from robots to smart homes and automated captions to synthesised speech [6]. The rehabilitation world has also produced evidence of the efficacy of products such as a switch or voice-operated call systems, telephones, or environmental control units. However, these often focus on the deficit (medical) model of disability rather than enabling the step change possible from current and future ICT and are often reported within small diagnostically based studies. Neither evidence base demonstrated a product ecosystem/supply network view nor a clear line of sight regarding the link between research and development, user testing or evaluation within contexts.

2. Methods

All outputs from the AT2030 programme published between October 2018 and July 2022 were reviewed and systematically clustered under the 'what works' lines of enquiry. which began with the initial research questions contained within the AT2030 bid AT2030 proposal, available here [7]. These research questions then evolved as the outputs were reviewed, and new themes and lines of enquiry were identified by the research team. The data were then synthesized and presented to the AT2030 partnership in a face to face workshop session in november 2022 which resulted in further iterations. The full methodology and results are being written as an open-access publication. Here we summarise the overall 'what works' research questions that have arisen through analysis according to the IMPACT 2 model [8], a widely used framework that is applied to AT interventions in rehabilitation contexts.

Furthermore, we also summarise here the role of ICT for low-and middle-income countries (LMICs) through the lens of the Disability Interaction (DIX) approach [9] which described a new agenda for developing technology for people with disabilities, before applying this model to the relevant AT2030 programme cluster. In the disabiltiy interactions model, disability inclusion is seen as a 'wicked problem' which requires a systematic and whollistic sollution. In thi smodel, effective outcomes for ICT users require a fearless engagement with the complexity of settings and contexts and a

commitment to going beyond small-scale studies. Technology (such as AT) is understood to be embedded in multiple ecosystems, which can be unlocked through co-created solutions with all stakeholders, open and scalable innovation practices, effective use of value tools and the application of applied and basic research methods focussing on radically different interaction modalities (see **Figure 1**) [9] We present an example of learning for each AT2030 cluster against the DIX framework.

Figure 1. Disability interaction principles (outer purple ring) and disability interaction dimensions (inner yellow ring)

3. Findings

3.1. What Works through the lens of the IMPACT 2 model

Figure 2 below summarises the research questions from the 'what works' analysis. This demonstrates the commitment to Context and Environment. The outcomes demonstrate the breadth and interconnectedness of the clusters of AT2030 work, spanning country-level implementation questions related to priority assisted product lists to the evidence and impact of a single intervention, which would be relevant to both private and public AT investors.

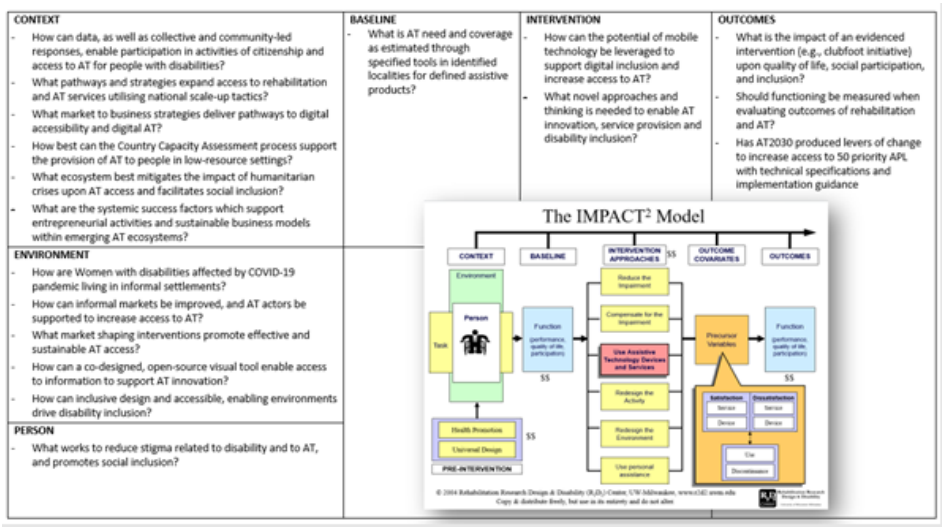

Figure 2: The IMPACT2 Model as a Framework for Unpacking the evidence-base of AT2030

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3.2. Exemplifying access to AT: initial findings from AT2030 (with a focus on ICT)

Within the AT2030 programme, parallel and separate fields of investigation discussed research and the development of digital products or adapting and designing products for the disability sector. Applying this new thinking to ICT, a conceptual reframing is offered by Holloway & Barbareschi in their 2022 text Disability Interactions (DIX): Creating Inclusive Innovations [9].

Data & Evidence: A scoping review of innovation strategies for AT [10] aligned with elements of the DIX framework. Specifically, the findings that open innovation and radical and disruptive innovation strategies were needed to unlock AT innovation pathways in AT provision and supply. Digital transformation was found to be an enabler of both for prosthetic services.

Innovation: An early AT2030 case study demonstrated how people with visual impairment use mobile phones in Kibera, Nairobi (Kenya). Instead of independently using a mobile phone, people used four types of interactions: supported (e.g. asking for help to learn to use the phone or read a text message), direct (e.g. independently making or receiving a call), dependent (e.g. handing over the phone for mobile top-ups with no control on if the action will be completed as requested) and restricted (e.g. unable to access the Internet due to lack of funds) [11]. This new evidence offered by AT2030 research stands with the AT user in considering innovation, utility, and impact. However, we must not consider ICT in isolation from physical AT. Examples such as the study of mobile use in informal settlements explore the reality that digital and physical technologies are used concurrently, opening rich possibilities for integrated and relational design [12].

Country Implementation: The Product Narrative approach [13] was used to create a Digital Product Narrative [14], which describes the ecosystem of Digital AT as four interconnected components : Devices (e.g. mobile phones) and accessories (e.g. braille

readers); Platforms or operating systems which enable consumption of what is on the device; Software and applications that fulfil a particular purpose or user activity; Content, such as text, text-to-speech, native language availability and pictograms. The rate of adoption of digital AT is supported by: "1) awareness of digital AT and its accessibility by users, developers, suppliers, providers, and policymakers; 2) availability of mobile network and internet connectivity; 3) the application of universal design and inclusion of accessibility features; and 4) appropriate training in digital AT" [15]. This clearly demonstrates the DIX need for co-created solutions across several actors, along with developing mechanisms to unlock increased value for the procurer to enable access for the end user.

Capacity & Participation: Austin and colleagues foreground the goals of participation and citizenship and the role of AT as mediator, demonstrating the emancipatory power of study designs that step beyond a product focus [16]. We also saw the power of digital communication through the #wethe15 [17] campaign linked to the Paralympics.

4. Discussion and Limitations

Using the IMAPCT2 model, we see multiple variables and engagement with complex systems. This delivers on the promise of the Disability Interaction approach and addresses a longstanding gap acknowledged in the knowledge translation literature concerning the absence of context and real-life applicability in scientific studies. As argued by Dijkers, while using 'best available' evidence to make decisions is important, the best may be the enemy of the good regarding real-world research and practical outcomes [18].

This paper has contextualised current developments in AT global policy and funding, introducing GHI Hub's mission-led approach and transformative model of change. We have illustrated the difference between traditional and new approaches with the example of ICT. However, we only present a snapshot of learnings using limited models. For example, we have not yet applied the SMART (Systems-Market for Assistive and Related Technologies) Thinking Matrix [19] to our data set.

5. Conclusion

AT2030 has purposefully engaged with the major humanitarian and political challenges of current times through a global, mission-led approach with measurable outcomes and clarity of ensuring a return on investment. An underpinning enabler is research and data, proven essential to enable countries to understand the return on investment for AT and the economic choices before them. In terms of products, testing and piloting market shaping are essential steps required before approaches are scaled.

Concurrently, determined work on systemic interventions with national governments is demonstrably essential, as is community participation and capacity building. The exclusion of AT users from programme design, policy and decision-making leads to poorer outcomes, continued power imbalances and political exclusion – these things are all part of the problem and solutions must be designed to counter this.

The AT2030 body of work practically illustrates the value of embracing complexity for AT ecosystem stakeholders including researchers, practitioners, AT users and policymakers.

Acknowledgments

This project is part of AT2030, a programme funded by UK Aid and led by the Global Disability Innovation Hub.

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