SCALING EDUCATION INNOVATIONS:

FINDINGS FROM MULTI-COUNTRY RESEARCH ON THE ADAPTATION AND SCALE-UP OF CAN'T WAIT TO LEARN IN LOW-RESOURCE AND FRAGILE SETTINGS

RESEARCH BRIEF
September 2024

Supported by:

GPE KIX
KNOWLEDGE INNOVATION EXCHANGE

IDRC · CRDI
International Development Research Centre
Centre de recherches pour le développement international

Canada

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Acknowledgements

This research programme was led by the War Child Alliance with the support of the Global Partnership for Education Knowledge and Innovation Exchange (KIX) global grant, a joint endeavour between the Global Partnership for Education (GPE) and the International Development Research Centre (IDRC). The views expressed herein do not necessarily represent those of GPE, IDRC, or their Board of Governors. The conclusions and recommendations made in the report represent the author's views.

This brief is written by Selin Turan and Jasmine Turner and is based on the research studies and knowledge products led by members of War Child's Research & Development department and all the research consultants involved who contributed their invaluable expertise. The authors extend sincere gratitude to everyone for their individual and collective contributions that made this impressive work possible. Additionally, the research team is grateful to the partners, teachers, schools, government members, community members, children, and caregivers who contributed their time, insights, and experiences. Their contributions have been essential to the depth and quality of this research programme.

Suggested citation:

Turan, S.*, Turner, J.S.*, Douaihy, L., Anan, J., Jordans, M., & D'Sa, N. (2024). Scaling Education Innovations: Findings from Multi-Country Research on the Adaptation and Scale-Up of Can't Wait to Learn in Low-Resource and Fragile Settings. War Child Alliance.

**joint first authorship*

ACRONYMS

cRCT	Cluster Randomized Controlled Trial
DLG	District Local Government
DPL	Digital personalized learning
EdTech	Education Technology
FCDO	Foreign, Commonwealth & Development Office
GMB	Group Model Building
GPE	Global Partnership for Education
ICT	Information and Communication Technologies
IDRC	International Development Research Centre
KIX	Knowledge and Innovation Exchange
LMICs	Low- and Middle-Income Countries
NGOs	Non-Governmental Organisations
PNA	Policy Network Analysis
SNA	Social Network Analysis
VfM	Value for Money
WCA	War Child Alliance

CONTENTS

INTRODUCTION

What are the challenges to education in low-resource and fragile countries?

Low- and middle-income countries (LMICs) are experiencing a long-standing learning crisis (World Bank, UNESCO & UNICEF, 2021), which has been exacerbated by the COVID-19 pandemic and increasingly unstable climate (Saavedra et al., 2022; Schady et al., 2023; UNESCO UIS, 2017). Heatwaves, droughts, and floods, all exacerbated by climate change, pose a significant challenge to education, particularly in regions with inadequate infrastructure and resources (Jenkins & Beardmore, 2024). Learning poverty, a key measure of the learning crisis, is defined as the percentage of children unable to read and understand a simple text by the age of 10 or upon completing primary school. In LMICs, learning poverty has increased in recent years, rising from 57% in 2019 to 70% in 2022 (Azevedo et al., 2022). Sub-Saharan Africa faces the greatest challenge, with a learning poverty rate of 89%, meaning that nearly nine out of ten children complete primary school without basic reading skills (Saavedra et al., 2022). The quality of education in such settings is compromised by overcrowded classrooms, wide variations in academic ability and age among students, teacher shortages, limited professional development opportunities, and weak educational infrastructure (Save the Children, 2020; UNESCO, 2024). In conflict-affected countries, additional pressures on the education system further exacerbate this crisis. Factors such as displacement, rapid influxes of displaced populations, differing languages of instruction, and the need for psychosocial support all contribute to the complexities of providing quality education in emergencies. Despite the scale of learning poverty, funding for education in emergencies is insufficient, accounting for less than 4% of all humanitarian aid (INEE, 2020). Addressing this crisis is crucial for making progress towards Sustainable Development Goal 4, which aims to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. However, achieving this goal requires education system transformation, including significant shifts in pedagogies to meet the learning needs of all children.

How can education technology help address the learning crisis?

Utilising technology in education has shown the potential to address barriers to quality education, support distance learning, and ensure the continuity of education during conflicts and emergencies (Rodrigues-Segura, 2022). While the use of EdTech has increased over the past decade, the COVID-19 pandemic highlighted its importance in supporting access to education and influenced many stakeholders' perceptions towards the value of integrating technology into education and the opportunities this can present (Chatila et al., 2023). Today, EdTech encompasses a wide range of forms from radio and television instruction to tablet-based learning and AI-driven programmes. The use of digital technology varies based on community and socioeconomic level, teacher willingness and preparedness, education level, and country income (UNESCO, 2023). Despite the increase in its use and successful scale-up of some EdTech solutions, many initiatives fail to due inadequate integration into educational practices and a lack of consideration for local contexts (Escueta et al., 2020; Global Education Evidence Advisory Panel, 2020; Major et al., 2021). Moreover, the affordability of digital technologies in education is still a major issue in resource-constrained settings and teachers require appropriate training and mentoring to use EdTech solutions effectively (Tauson & Stannard, 2018). The question surrounding the effectiveness and appropriateness of EdTech as a tool in conflict-affected and resource-constrained settings remains open, highlighting the need for rigorous evidence.

What is EdTech and Digital Personalised Learning?

According to UNESCO, EdTech refers to the use of Information and Communication Technologies (ICT) to enhance and expand access to education, improve teaching quality, and develop the digital skills necessary for life in the 21st century (Miao et al., 2022). Digital Personalised Learning (DPL) is a subset of EdTech that uses technology to provide tailored learning experiences that adjust to individual learners' needs and progress, offering personalised support and resources at varying levels of adaptation (Major et al., 2021). In LMICs, the most common EdTech solutions used are computers and tablets to provide individualised instruction whereas the most common DPL solutions are mobile phones and tablets (Tauson & Stannard, 2018).

What did we learn from previous research about Can't Wait to Learn?

War Child Alliance's (WCA)'s Can't Wait to Learn, is an evidence-based DPL programme that provides online and offline access to self-paced, competency-appropriate learning through tablets charged with solar panels. The programme's content is aligned with the national literacy and numeracy curricula and approved by the relevant Ministries of Education. Designed to operate in the most challenging environments lacking educational infrastructure and adequately trained teachers, Can't Wait to Learn aims to enhance foundational literacy and numeracy skills and support (re-)integration of children into formal education. Since its inception in Sudan in 2012, Can't Wait to Learn has expanded to seven countries, reaching over 200.000 children. Since 2022, it has been implemented in Ukraine, further illustrating its adaptability to provide quality education to children amidst active conflict. Can't Wait to Learn's relevance in diverse conflict-affected and low-resource settings has been validated through rigorous research, demonstrating its contextual and cultural feasibility and acceptability (Brown et al., 2020; Stubbé et al., 2016; Turner et al., 2022). A quasi-experimental evaluation of Can't Wait to Learn in Sudan (Brown et al., 2020) (n=221) showed that children (aged 7-9) doing Can't Wait to Learn who had never been to school before made significantly larger gains in numeracy ($d=0.90$, $p<0.001$) and Arabic literacy ($d=0.90$, $p<0.001$) than children doing education as usual. The evaluation also demonstrated a positive effect on self-esteem ($d=0.17$, $p<0.05$) and psychological wellbeing ($d=0.41$, $p<0.05$). In a non-controlled pre-post evaluation in Lebanon (Turner et al., 2022), out-of-school children aged 10-14 (n=390), had significantly larger gains in numeracy after 12 weeks of Can't Wait to Learn implementation ($d=0.3$, $p<0.001$). The study also showed self-reported improvements to children's self-esteem ($d=0.3$, $p<0.05$) and reduction in symptoms of poor mental health ($d=0.2$, $p<0.01$).

The findings and evidence from previous studies have influenced the design and implementation of the programme and the establishment of high-quality implementation standards. As a result of previous research, there have been:

- Improvements to the programme and game design, for example modifications of the facilitator's role, ensuring children's safety, promoting attendance, and providing exercise books to support learning at home.
- Focus on necessary adaptations to increase the cost-effectiveness of Can't Wait to Learn, such as exploring ways to increase the child-to-tablet ratio and enhancing caregivers' involvement in education, which would contribute to improved attendance and retention, better learning outcomes, and greater programme efficiency.
- Better understanding of the barriers to education and how Can't Wait to Learn can overcome these and greater nuance in understanding of how teachers view their engagement with technology in the classroom, for example, looking at self-efficacy and stress in Ukraine.
- Uptake by Ministries of Education in different contexts and the integration of Can't Wait to Learn into formal education systems.

How do we address the evidence gap through our research programme?

WCA's multi-year global research programme, ***"Bridges to impact through innovative educational technology: Forging links between policy, research, and practice"***, supported by the Global Partnership for Education Knowledge and Innovation Exchange (GPE KIX), is designed to address the evidence gap on how to effectively adapt and scale up EdTech solutions in conflict-affected and low-resource settings. Implemented in Uganda, Chad, and Sudan between 2020 and 2024, with a focus on Can't Wait to Learn, the research investigated the effectiveness, cost-effectiveness, and conditions required for successful adoption and scaling of EdTech solutions in low-resource and fragile contexts. Also, through the project, a complementary programme – SchoolLinks – was developed. SchoolLinks aims to increase children's access, attendance, and retention in school by strengthening caregivers' engagement in children's education and the home-school relationship. It is designed to increase the cost-efficiency of Can't Wait to Learn and other education initiatives, thus supporting their scalability. Through this research, WCA also generated valuable knowledge on government adoption of EdTech solutions, providing insights into the processes and conditions that facilitate successful integration of programmes like Can't Wait to Learn into national education systems.

Can't Wait to Learn is an evidence-based DPL programme, offering online and offline access to self-paced quality learning on solar-powered tablets, designed to strengthen foundational literacy and numeracy skills, and therefore builds a solid foundation for children to reintegrate into formal education. It has been rigorously researched and improved since its inception in Sudan in 2012, which led to promising evidence on its contextual and cultural appropriateness and feasibility of implementation in conflict-affected and low-resource settings.

Click here for a short video to learn more about Can't Wait to Learn.

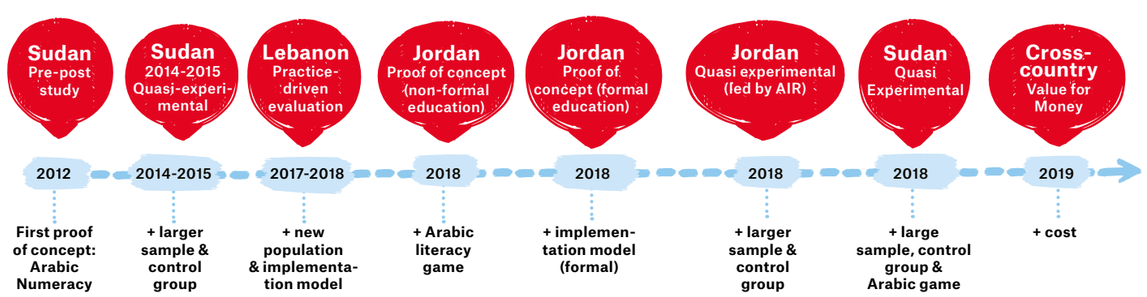
Key features

- Reading and Numeracy
- Available in Arabic, English, French[1], and Ukrainian
- Aligned with national curricula
- Co-created content with children and community
- Embedded in formal, non-formal, accelerated, and emergency response education
- Provides hardware, including solar systems, tablets and headsets
- Operational in Chad, Jordan, Lebanon, South Sudan, Sudan, Uganda, and Ukraine (as of 2024).

[1] *French version is available for numeracy only as of September 2024.*

RESEARCH JOURNEY

2012 to 2019



2020-2024: KIX research programme

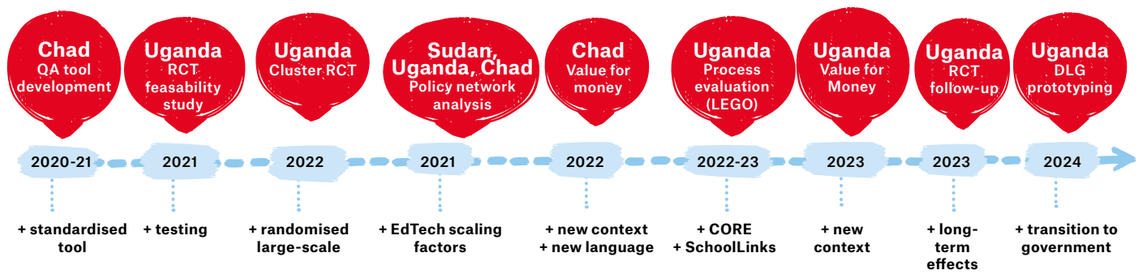


Figure 1: *Can't Wait to Learn research 20212-2019*

Figure 2: *Can't Wait to Learn research 2020-2024 (KIX research)*

SchoolLinks is a community-based approach to increase school access, attendance and retention. It consists of six complementary strategies involving caregivers, teachers, school management, community leaders and children. It was designed in four refugee settlements in Uganda through Group Model Building workshops with teachers, caregivers, out-of-school children and youth.

Key features

- Complementary, simple strategies
- Co-designed with caregivers, teachers, community members and children
- Low-cost and adaptable

RESEARCH JOURNEY

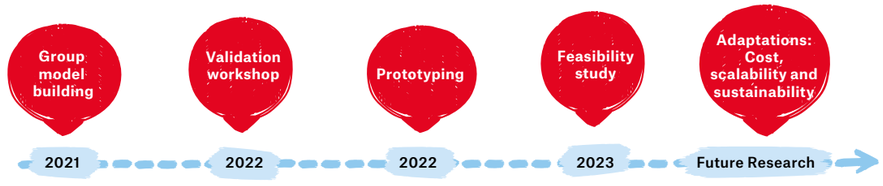


Figure 3: *SchoolLinks's research journey*

SCHOOLLINKS STRATEGIES

1 **Meetings** increase communication between school staff, community leaders, and caregivers.

2 **Translation** during meetings to overcome language barriers and enable meaningful participation of all, provided by volunteers.

3 **Digital enrolment** collects demographic and disability data and brings teachers and caregivers together to produce mutual under-standing of individual children's needs, per-formance, and support required.

4 **Attendance monitoring and re-wards,** such as soap or scholastic materials, incentivising attendance and helping to reduce household financial con-straints by contributing to basic needs.

5 **Homework** clubs promote children's peer learning, supervised by caregivers.

6 **Safety to school** groups where children walk together to increase safety and motivate attendance.

RESEARCH DESIGN

Our research portfolio consisted of five complementary areas of research to generate evidence and answer the question:

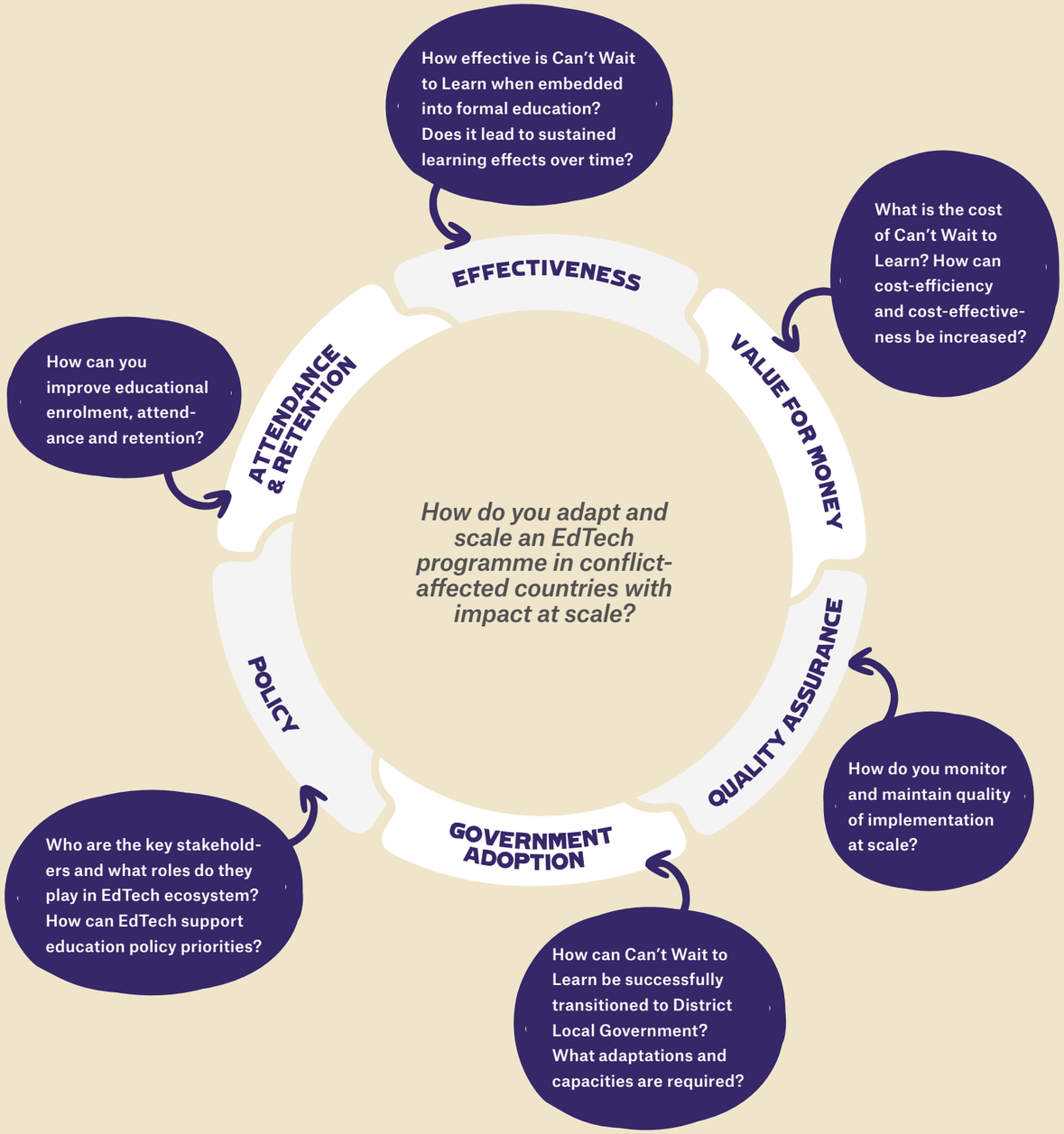


Figure 4: *WCA's KIX-supported research agenda in Chad, Uganda, and Sudan*

Effectiveness:

Aim: To evaluate the effectiveness of Can't Wait to Learn in accelerating gains in foundational literacy and numeracy
Questions:
1) How effective is Can't Wait to Learn when integrated into formal education?
2) Are the effects of Can't Wait to Learn sustained one year after the intervention has ended?
3) What are the effects of Can't Wait to Learn on population subgroups?
Methodologies:
1) A cluster Randomised Controlled Trial (cRCT) in government schools (n=30) with P3 students (n=1507) in Isingiro District of Uganda for a duration of two school terms, with numeracy and literacy as primary outcomes, complemented by qualitative data collection in government schools (n=4) through focus group discussions (n=12) and key informant interviews (n=10);
2) A follow-up study assessing the cRCT participants (n=1304), one year of Can't Wait to Learn implementation had ended;
3) A quasi-experimental study in government schools (n=20) with students from 'Cours élémentaire' 1 & 2 (n=822) – the equivalent to P2 and P3 – in refugee and host-community settings in Chad.
Implementation models:
1 and 2) Can't Wait to Learn (40%) + formal education (60%) vs. formal education (100%) in Uganda;
3) Can't Wait to Learn (50%) + formal education (50%) vs. formal education (100%) in Chad.

What is a (cluster) Randomised Controlled Trial?

A Randomised Controlled Trial (RCT) is a research method that aims to evaluate the causal impact of an intervention. Participants are randomly selected and assigned to either the intervention group, which receives the programme under evaluation, or the control group, which does not. RCTs use random assignment to create comparable groups, which helps control for structural bias and ensures that differences in outcomes can be attributed to the intervention itself rather than other unobserved factors. This method provides high-quality evidence of whether an intervention has the desired impact.

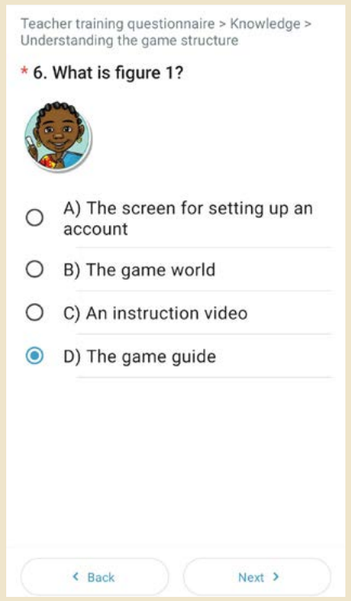
In a cluster RCT, groups of individuals, such as schools or households ('clusters'), are randomly selected and assigned to either the intervention or control group. Therefore, the randomisation occurs at the cluster level, rather than at the individual level. This method is useful when the intervention is delivered at a group level or when individual randomisation is not practical or feasible.

Value for Money:

Aim: To evaluate and identify ways to increase the cost-effectiveness of Can't Wait to Learn
Questions:
1) What is the cost of Can't Wait to Learn?
2) How can cost-efficiency and cost-effectiveness be increased?
Methodology: A value for money (VfM) analysis based on Foreign, Commonwealth & Development Office (FCDO)'s 5E framework (i.e. economy, efficiency, effectiveness, equity, cost-effectiveness), using reach numbers, financial and learning outcome data, attendance and completion rates, and demographics
Analyses conducted:
1) Can't Wait to Learn implementation through partners in refugee and host community settings compared to education as usual in Chad;
2) Can't Wait to Learn integrated in government schools compared to education as usual as part of the cRCT in Uganda

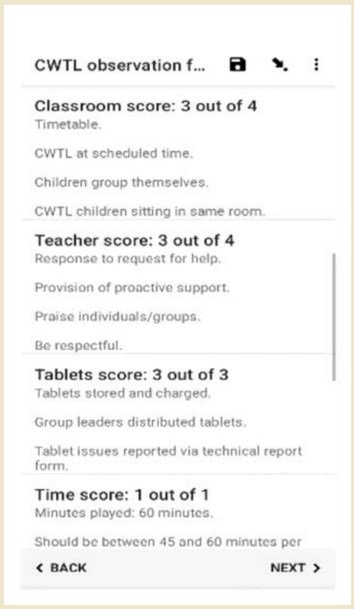
Quality assurance:

Aim: To develop tools and processes to monitor and maintain quality of implementation at scale
Question: How do you monitor and maintain quality of implementation at scale?
Methodology: Synthesis, testing, and improvement of two digital quality assurance tools in Chad and Uganda that enable data-driven quality improvement: (1) Teacher's Self-Assessment; (2) Can't Wait to Learn Observation Form.



What is Teacher's Self-Assessment?

The **Teacher Self-Assessment** is used during the Can't Wait to Learn teacher training to assess teachers' attitudes towards using technology in the classroom and knowledge of Can't Wait to Learn implementation features. This tool helps trainers to identify teachers' knowledge gaps and concerns and address these during the final day of the training, thereby increasing its efficiency and effectiveness.



What is the Can't Wait to Learn Observation Form?

The Can't Wait to Learn Observation Form is used in structured observations of programme sessions. It assesses how closely the actual implementation aligns with the original design (i.e. fidelity), ensuring that all the key implementation components are respected and implemented to produce the most effective version of implementation. Real-time data helps the observer provide teachers with tailored mentorship to support their professional development needs and quality implementation of Can't Wait to Learn.

Attendance & retention:

Aim: To improve school attendance and retention through the development and evaluation of SchoolLinks
Question: How can you improve educational enrolment, attendance and retention?
Methodology: Group Model Building workshops with school staff and caregivers to co-design SchoolLinks, followed by prototyping and a pre-post evaluation at public schools in Uganda.

What is Group Model Building?

Group Model Building (GMB) is a community-based system dynamics method where participants collaboratively identify and connect variables affecting a central issue, generating ideas to influence the entire system positively (Hovmand, 2014). GMB workshops played a crucial role in designing SchoolLinks. Caregivers and teachers identified and categorised all factors affecting children's attendance and caregivers' involvement in education, articulated how factors affect each other, and then developed action plans. This participatory process facilitated the creation of complementary strategies to positively affect the system of factors and actors that influence children's school attendance and drop-out in conflict-affected settings.

Policy:

Aim: To investigate the EdTech ecosystem and policy landscape in terms of actors, relationships, challenges and opportunities for EdTech.
Questions:
1) Who are the key stakeholders and what roles do they play in EdTech ecosystem?
2) How can EdTech support education policy priorities?
Methodology: A policy network analysis that combined key informant interviews (n=19), analysis of policy documents (n=16), and social network analysis of relationships between actors working in the EdTech sector in Chad, Sudan, and Uganda.

What is Social Network Analysis?

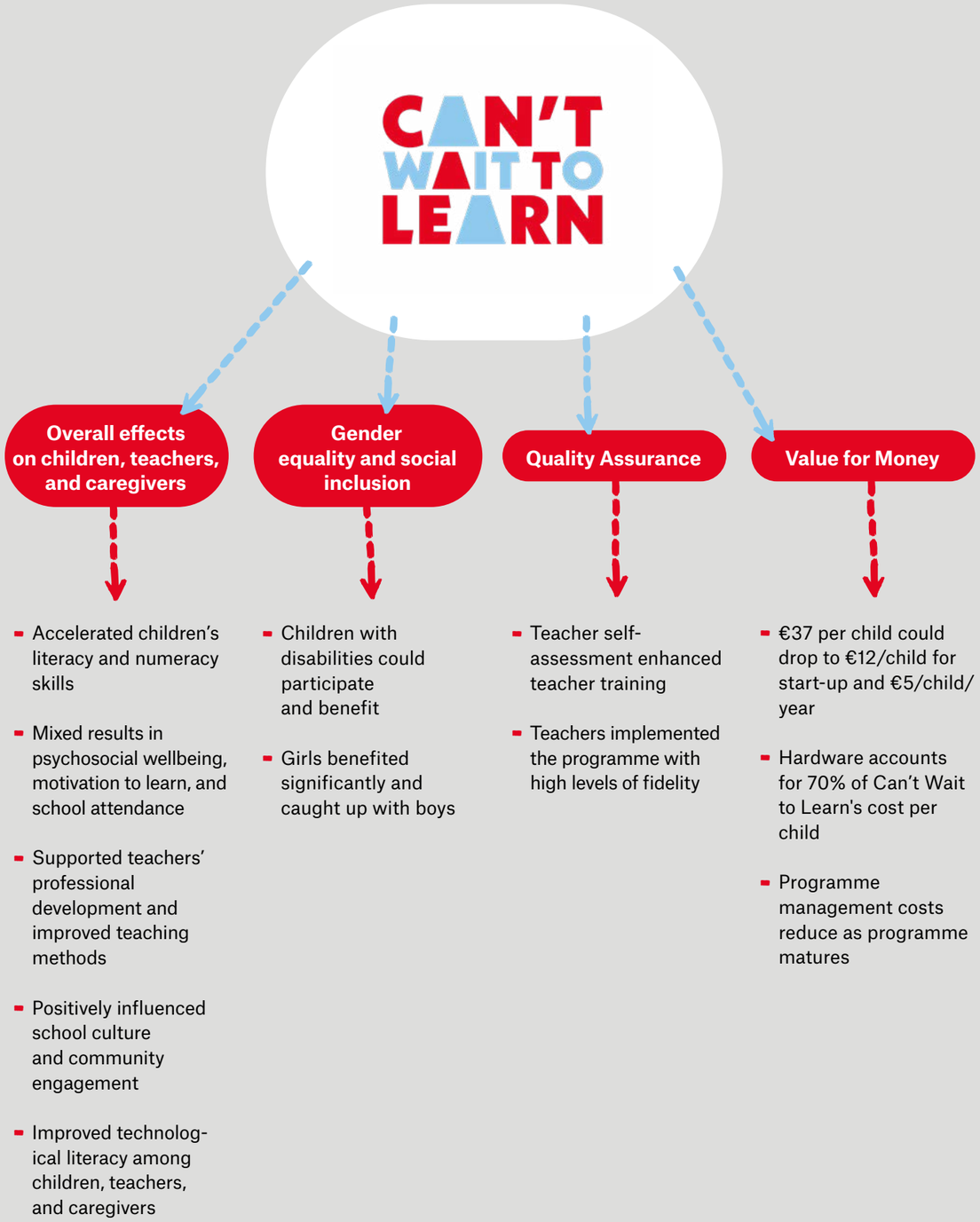
Social Network Analysis (SNA) is a methodological approach based on the premise that relationships among actors within a network crucially influence social outcomes (Wasserman & Faust, 1994). SNA focuses on how actors' connections to each other, rather than just their individual characteristics, shape the flow of information and resources and determine their opportunities and constraints (Borgatti, Everett, & Johnson, 2018). In WCA's policy research, SNA was employed to explore how interactions and power dynamics among different stakeholders influence the EdTech network and the development of EdTech policies and programmes in Chad, Sudan, and Uganda.

Government Adoption:

Aim: TTo generate learnings on the process and needs to transition Can't Wait to Learn management and implementation from WCA to district-level government.
Questions:
1) How can Can't Wait to Learn be successfully transitioned from an (I)NGO to District Local Government?
2) What adaptations and capacities are required?
Methodology: Prototyping, which involved iterative cycles of observation of programme management and implementation, identifying challenges and gathering feedback from stakeholders, collaborative solution development, and testing again.

RESEARCH FINDINGS

What did we learn about Can't Wait to Learn?



Overall effects on children, teachers, and caregivers

Accelerated children's literacy and numeracy skills
The cRCT demonstrated that students participating in the Can't Wait to Learn programme made significantly larger gains in literacy and numeracy compared to those receiving standard formal education. In literacy, significant improvements were observed in letter knowledge (d=0.22, p<0.001), phonemic awareness (d=0.58, p<0.001), most-used words (d=0.20, p<0.001), decodable words (d=0.32, p<0.001), reading fluency (d=0.20, p<0.01), and reading accuracy (d=0.16, p<0.01). However, children doing Can't Wait to Learn showed significantly smaller gains in writing competency (d=-0.11, p=0.02), which is important to take into consideration for programme improvements going forward. For numeracy, significant gains were noted in number identification (d=0.13, p<0.05), quantity discrimination (d=0.19, p<0.001), timed subtraction (d=0.28, p<0.001), and word problems (d=0.14, p<0.05). The total literacy score yielded an effect size of 0.32 (p<0.001), while the total numeracy score showed an effect size of 0.25 (p<0.001). These improvements are likely due to the programme's personalised learning approach, where individual competency levels are assessed through a placement test and progression to harder content is only possible once mastery of skills is demonstrated, thus ensuring strong foundational learning. Additionally, when compared to other DPL programmes in LMICs, Can't Wait to Learn demonstrated larger than average learning gains, as compared to the effect size of 0.18 (95% CIs 0.12-0.24), p = 0.001) from 15 RCTs included in Major et al.'s (2021) meta-analysis (Turner et al., 2024).

Mixed results in psychosocial wellbeing, motivation to learn, and school attendance
Although no quantitative difference in change in psychosocial well-being between the control and intervention groups was observed in the cRCT, participants in the Can't Wait to Learn programme qualitatively reported improvements in psychosocial well-being, including increased self-esteem, motivation, and discipline. Despite facing daily challenges like bad weather, long distances to school, and household chores, the participants expressed that they were inspired and motivated to attend school regularly because of Can't Wait to Learn. Caregivers also observed a significant increase in their children's engagement and motivation to learn, which they attributed to the interactive and enjoyable nature of the tablet-based games. One caregiver mentioned: "Ever since [my son] started learning [using Can't Wait to Learn], he has never missed a class. [...] even if my child is sick, he will wake up and go to school." (Caregiver)

Supported teachers' professional development and improved teaching methods
Teachers qualitatively reported that Can't Wait to Learn benefited them by providing new teaching methods and improving their technical skills. Throughout implementation, teachers received support through training, mentorship, and collaborative activities with other teachers, fostering a supportive professional environment. Teachers noted that this not only helped them manage classrooms better, but also enabled them to incorporate new skills and strategies that improved student engagement. Additionally, teachers expressed their increased confidence in using digital tools, with one teacher stating: "Another thing it [the programme] also helped me learn is how to deal with minor [issues] in the tablets. If let's say the child's tablet has a problem, I have an idea on how to deal with minor problems." (Teacher)

Positively influenced school culture and community engagement
Qualitative evaluation in Uganda revealed that Can't Wait to Learn provided a new and valuable experience that positively influenced the school culture and community engagement. Teachers and headteachers mentioned that the school was recognised within the community, with caregivers visiting to witness their children's progress as one caregiver stated: "This programme is so good. [...] I am one of the committee members and I had an opportunity, one time we had a meeting, and we also went to class to see those [tablets]." Furthermore, Can't Wait to Learn provided schools with hardware, such as solar system for charging tablets. The teachers and community members expressed large satisfaction with this, as they utilised them for other purposes: "The programme also provided solar system to our school which provided light. Teachers had nowhere to charge their phones, so when the programme came, it provided charging system for teachers and even the community. Some people who were nearby, the parents, could bring their phones to be charged". (Headteacher)

Improved technological literacy among children, teachers, and caregivers
Can't Wait to Learn introduced participants, including children, teachers, and caregivers to the use of tablets for educational purposes which led to the increase in their technological skills. This was particularly notable in areas where access to such technology was previously limited. Children qualitatively reported becoming proficient in using tablets for learning, while teachers reported development in their skills to manage and troubleshoot the devices, boosting their confidence in incorporating technology into teaching. A teacher noted, "We [teachers] have learnt skills. We did not know how to teach using tablets, so we also got that advantage of learning how to teach students using tablets." Caregivers also benefited, as children helped their families become more familiar with these devices at home or school.

Gender equality and social inclusion

Children with disabilities could participate and benefit
The personalised learning approach offered by Can't Wait to Learn could allow children with diverse needs and those facing consistent barriers to education to engage with content at their own pace and benefit from the programme. While a caregiver in Uganda shared positive feedback about their daughter with a disability benefiting from the programme, the RCT sample size for children with disabilities was too small to make definitive claims: "[Can't Wait to Learn] has improved her knowledge. [...] Now I believe she will improve and become 1st [...] because now I see she is very happy, I see despite the disability, when she continues progressing, she will be in a better position in the days to come." (Caregiver). Further research is needed to explore the programme's full impact on children with different abilities.

Girls benefited significantly and caught up with boys
Girls enrolled in the Can't Wait to Learn programme in Chad initially started with lower scores than boys but managed to catch-up to them in just 4.5 months. A sensitivity analysis comparing the learning gains of girls and boys revealed that the effect size for girls was four times larger (d=0.8, p<0.01) despite the programme still having a significant impact on boys' learning (d=0.2, p<0.01). This finding holds great significance for Chad, especially considering that the country was ranked 145th out of 146 countries for gender gap in educational attainment (World Economic Forum 2022).

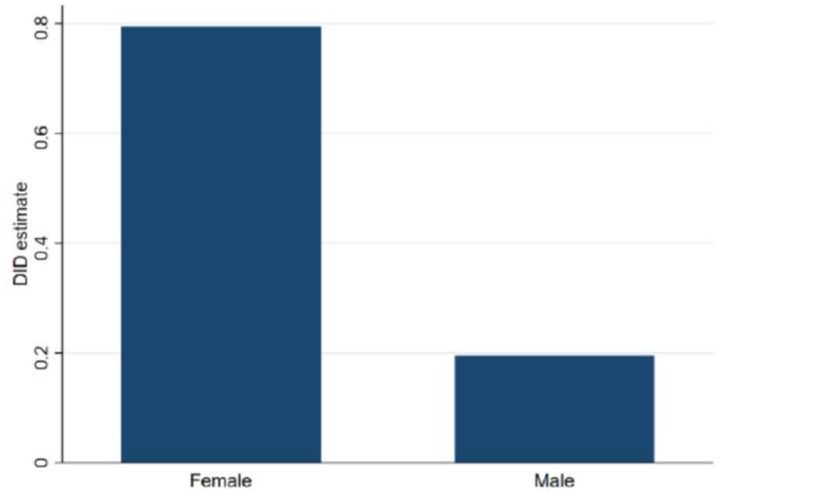


Figure 6: *Intervention effect by gender in Chad*

Quality assurance

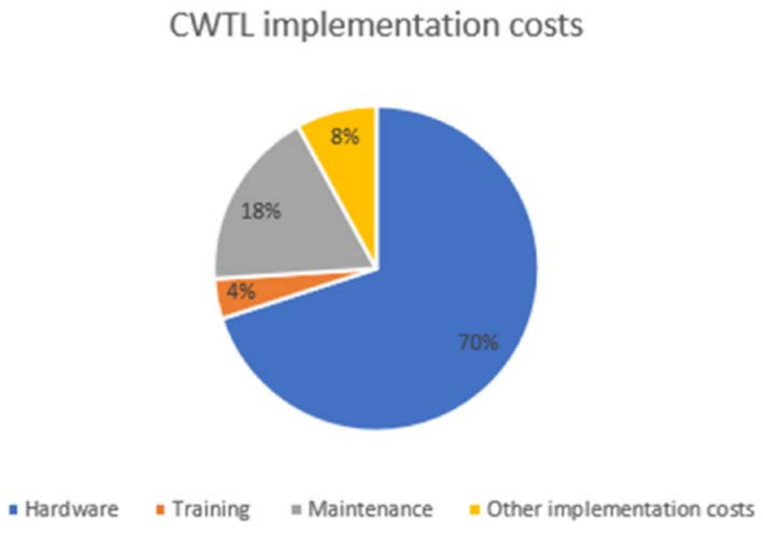
Teacher self-assessment enhanced teacher training
The teacher self-assessment helped improve the quality of the teacher training. Used on the penultimate day of training, the teacher self-assessment provided immediate insights into areas where teachers needed further support and understanding of Can't Wait to Learn programme content for successful implementation. Additionally, the mentorship sessions provided to teachers brought the Can't Wait to Learn project officers and teachers together, creating a sense of friendship and supportive environment: "So, it helped us [teachers] build, you know, that strong relationship and helped each of us to manage those challenges and address them. Like the general support, that tool eased our implementation" (Teacher).

Teachers implemented the programme with high levels of fidelity
The Can't Wait to Learn observation form provided robust data on implementation fidelity, relatively high at 91% measured across 108 observations (11% of total sessions) of Can't Wait to Learn implementation during the cRCT. This reflects the successful implementation of key intervention components of Can't Wait to Learn such as classroom management, tablet usage, session timing, and teacher mentoring. Although there was some variation between schools, ranging from 79% to 98%, the majority demonstrated high levels of fidelity, particularly in areas like tablet management and classroom practices. The project officers implementing the programme mentioned that the form supported them to identify gaps and challenges which informed targeted mentoring and coaching to teachers: "It helped because it guided me in which areas I can put my focus on after each [Can't Wait to Learn] session" (Project Officer).

Value for Money

€37 per child could drop to €12/child for start-up and €5/child/year
The value for money analysis of Can't Wait to Learn for the cRCT in Uganda showed that the annualised setup cost was €37 per child (including solar systems, tablets, tablet accessories, headphones, and game ùmaintenance). Cost modelling of implementation in 200 schools which incorporates cost-efficiency modifications indicates that recurrent costs (i.e. to maintain implementation after setup) could be reduced to just €15 per child per year. If more significant changes to implementation were made, such as expanding Can't Wait to Learn to P4 and P5 and rotating the tablets between classes, setup costs could be reduced to just €12 per child and a recurrent cost of €5 per child per year.

Hardware accounts for 70% of Can't Wait to Learn's cost per child
Solar systems, tablets, and accompanying accessories and protection measures constitute 70% of the total cost of Can't Wait to Learn implementation (see below for breakdown). Of this, almost half is the solar systems and their installation. The remaining 30% is the recurrent (i.e., annual) costs, split across training (18%), hardware maintenance (4%), and other implementation costs (8%), including game maintenance, fuel for transport for supervision, and direct implementation staff (i.e. IT officers, technical coaches, and drivers). The solar systems and tablets are vital for equitable access - not relying on electricity or personal devices - and the 'value' of reaching vulnerable populations is unquantifiable. Similarly, the value of providing electricity to a school and the wider community is considerable. Going forward, the programme could explore possibilities of collaborating with solarisation projects, thus substantially reducing the cost of setting up Can't Wait to Learn.



Programme management costs reduce as programme matures
Programme management costs have been reduced significantly over time. In 2019, a VfM analysis showed that staffing costs constituted 66% of Can't Wait to Learn costs. Another VfM conducted during the first year of implementation in Chad through an implementing partner showed a similar 65% on personnel (14% global team, 20% country-level management, 31% direct field implementation and management). However, the most recent VfM analysis, conducted after Can't Wait to Learn was implemented for 4 years in Uganda, demonstrates a total personnel cost constituting just 13% of all costs. This reduction reflects the growth of institutional knowledge of Can't Wait to Learn within War Child, as well as the capacity to support partner implementation.

What are non-monetised benefits of Can't Wait to Learn?

- **Assured progression through national curriculum:**
  Can't Wait to Learn is aligned with the national curriculum of each country where it has been implemented. Children cannot progress through the game before mastering prior content, ensuring that each child follows the entire curriculum content.

- **Reduction in planning time for teachers:**
  The amount of time that teachers need to spend planning lessons is reduced due to the personalised nature of Can't Wait to Learn. Children log into their accounts at the beginning of each Can't Wait to Learn session and start playing where they left off.

- **Opportunity for differentiated learning:**
  As well as the in-game differentiation, lowering the class size by half or a third allows the teacher to give more focused and differentiated attention to groups and individual students.

- **Possible other uses of solar panels:**
  Communities explore various other uses of solar panels such as lighting for studying at night and creating a community cinema amongst many other examples to maximise their benefits.

- **Technological literacy:**
  Can't Wait to Learn helps children, teachers, and caregivers improve their technological skills by introducing digital tools, especially in rural and underserved areas with limited access to technology.

- **Adaptable nature of implementation:**
  Can't Wait to Learn is adaptable to different contexts and needs of education systems. It can be implemented in various languages, with children of different ages, grades, and displacement statuses. The implementation model can also be adapted to fit available resources and integrated into formal education or provided as a catch-up nonformal learning programme.

- **Supporting teachers and facilitators:**
  A shortage of adequately trained teachers and funds for their salaries are significant challenges to education in resource-constrained settings. Can't Wait to Learn provides ongoing professional development and mentoring sessions to teachers and facilitators which supports their professional development.

RESEARCH FINDINGS

What did we learn about SchoolLinks?

- Improved children's school attendance and retention
- Improved teachers' motivation and teaching practices
- Improved caregivers' engagement and attitude towards education
- Increased communication between caregivers and teachers led to positive relationships
- More peer learning between children, better behaviour and safety

- Benefited girls' safety and confidence
- Reduced boys dropping out of school to work
- Promoted inclusion of illiterate caregivers
- Teachers and learners supported children with disabilities
- Supported lower income families
- Increased social cohesion in the community

Effects on children, teachers, and caregivers

Improved children's school attendance and retention
Almost three-quarters of children participating in SchoolLinks attended over 95% of school days compared to 32% in comparison schools, over one school term of implementation, indicating a marked difference in attendance. School staff, caregivers, and students attributed this difference to the use of star charts and the related rewards for high attendance. Participants also felt that higher attendance and the Homework Clubs could result in improved exam scores and class performance; "There has been an improvement in my performance because I currently attend class more than before where I used not to take school seriously" (Learner, P5)

Improved teachers' motivation and teaching practices
Teachers expressed that the enhanced communication with caregivers deepened their relationships with learners, which increased their motivation and improved their teaching practices; "through this intervention, it has come in as a bridge through the three partners; the child knows who the teacher is, the parent knows who teaches his or her daughter. So, it has united the three partners to uplift the standards of the child" (Teacher, P3).

Improved caregivers' engagement and attitude towards education
Participants explained that caregivers attended meetings more frequently and followed-up on their children's schooling more closely, resulting in a more supportive home environment for children's education and payment of school fees: "Our parents are always motivated to give us whatever we ask for from them for example they give us school fees so easily when we take [the rewards] home because they feel the burden of buying these essentials given to us is reduced and they use the money they would have set aside for the essentials to top up and pay school fees. For instance, if I am in need of exam fees, she gets it quickly" (Learner, P5).

Increased communication between caregivers and teachers led to positive relationships
Provision of translation in meetings was felt to lead to enhanced communication between caregivers and teachers; "these caregivers were very happy and appreciated the way how they could understand what was discussed within those meetings because each and everybody could now interact freely because they could understand the language that was used during those meetings" (Deputy headteacher). This positively influenced relationships – "I would say that the parents-teachers-child relationship really improved" (Teacher, P3) - which contributed to teachers' increased care for children; "In case [the teacher] notices anyone absent in class, she tries to follow up with parents to find out [the child's] whereabouts and that shows a teacher's concern towards a child" (Learner, P5) and better children's behaviour in class: "In addition, indiscipline case was minimized because we got to know parents of the children and they feared being reported to their parents that they had bad manners. This has helped" (Teacher, P3).

More peer learning between children, better behaviour, and safety
Participants expressed that the Homework Clubs fostered peer learning: "We liked [Homework Clubs] so much because children have improved on their performance the fact that they discuss with each other and explain things to themselves and understand easily" (Caregiver, P5). Teachers also observed that more frequent attendance and homework completion has led to better behaviour: "the children's experience now is that they are responding in class. They are very attentive and that is why they are improving in performance" (Teacher, P4). The Safety to School initiative "helps to avoid child trafficking" (Caregiver, P4) and reduce truancy: "Children going to school in groups helped a lot because some were found of stopping on the way to play in the village, they can't do that anymore and even in case of anything fellow learners can help" (Caregiver, P5).

Gender equality and social inclusion

Benefited girls' safety and confidence
Walking in groups to school was particularly beneficial to girls, with participants expressing that it increased girls' safety and confidence: "These girls have become very free on the roads; very free because they can walk together with the boys. For bigger girls the fear was because, as they are coming, there's a trading centre and they fear the boys there, there are those who drink and they stay till morning. So as these girls are coming, they can meet [their classmates] on the way, and now these girls walk courageously, they don't fear anything;" (Lead implementer). Initiatives like the distribution of soap bars as rewards for attendance also helped improve girls' hygiene, leading to a more inclusive environment where girls felt more comfortable going to school

Reduced boys dropping out of school to work
Teachers reported that the possibility of receiving rewards motivated boys to stop working and focus more on their education: "We had a problem of some boys who would miss school to carry matooke [bananas] to the roadside to make money but when you introduced stars, they are no longer carrying matooke" (Teacher, P5) and caregivers felt that the Homework Clubs and Safety to School groups had a similar positive influence: "These groups helped my child because he used to leave home and say he is going to do homework with his friends, only to find out he was carrying matooke on trucks. Ever since he joined the project groups other children keep an eye on him" (Caregiver, P5).

Promoted inclusion of illiterate caregivers
All caregivers, whether literate or not, who were willing to volunteer their time as Homework Club supervisors were welcomed, which was appreciated: "Children used to gather in my home to do their homework yet I did not go to school so I wouldn't be able to assist them academically, but I did my part of supervision to make sure they do not play instead of doing their homework" (Caregiver, P3). School management recognised the importance of caregivers being informed about school activities and now make additional efforts to include illiterate caregivers: "if a caregiver was illiterate and could not read the letter, we use [meetings] now to tell them. We also now make an assembly and tell the children about what is in the letter so that they could go and inform and tell their parents and even read those letters for them so that they can understand, they can maybe get aware of when the meeting is being conducted" (Deputy Headteacher).

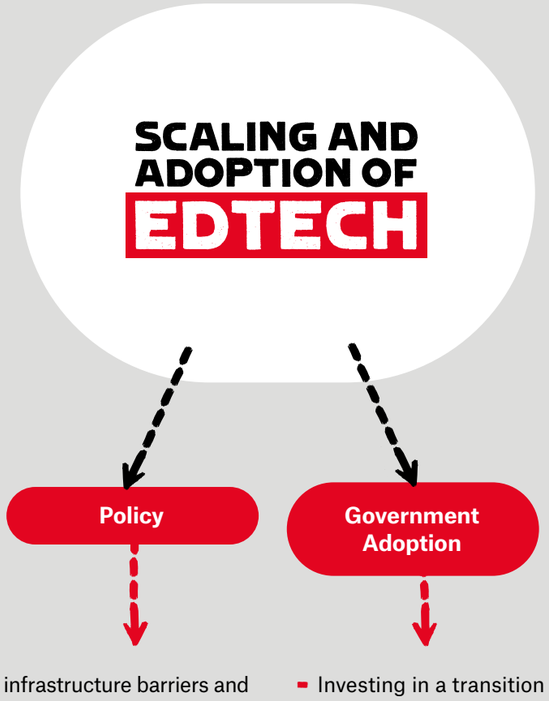
Teachers and learners supported children with disabilities
One-to-one conversations with caregivers during enrolment increased teachers' knowledge of children's needs which enabled adjustments to their teaching: "We needed to know those who can't hear well, or see well, and the children were able to come out and tell us that they can't see well. So, we came to know their problems which was not the case at first" (Teacher, P5). Peer learning during Homework Groups were highlighted as supporting children with additional needs: "My daughter is very grateful because she had a problem with her ears in that she could not hear very well when studying among the many children. Using a tablet [Can't Wait to Learn] and studying together with her friends in groups on Sunday has helped her a lot because she is able to ask her friends without fear in case she does not understand what the teacher said" (Caregiver, P3).

Supported lower income families
By providing scholastic materials and soap as rewards for high attendance, SchoolLinks was particularly appreciated by lower socioeconomic families. Improved home-school relationships and frequent communication between teachers and caregivers were perceived to help increase teachers' understanding of home conditions and made them better equipped to support learners from single-parent homes or those in difficult living situations: "Pressure towards school fees defaulters have been worked on by the headmaster especially for those whose parents are financially unstable, due to such meetings where they get a chance to present their issues" (Learner, P3).

Increased social cohesion in the community
Caregivers and teachers observed that bringing children from different households together for the Homework Clubs positively influenced relationships between caregivers from different tribes, including those with historical tensions: "The program has also improved the way children relate with each other and have become more friendly to each other. There were homes that never related with each other, but the children had to attempt homework together in one home regardless of the differences between their parents and this did not affect them as children which also to some extent reconciled their parents and this is a very good thing in society" (Caregiver, P3).

RESEARCH FINDINGS

What did we learn about scaling and adoption of EdTech innovations?



- Overcoming infrastructure barriers and strengthening teachers' technological capacity are pivotal
- Government policy on EdTech is an indicator of readiness to scale
- Forging partnerships with government, private sector, and universities strengthens EdTech ecosystem
- Capitalising on opportunities can accelerate EdTech scale-up
- Investing in a transition period is crucial
- Capacity-strengthening should be centred on the local education stakeholders
- Integrating processes and tools into the governance structure ensures quality

Policy

Overcoming infrastructure barriers and strengthening teachers' technological capacity are pivotal
The policy network analysis (PNA) case studies conducted in Chad, Uganda, and Sudan identified several barriers that hinder the scale-up of EdTech in conflict-affected countries. In rural areas, access to reliable electricity and internet connectivity is scarce, if not non-existent. Many EdTech initiatives require access to electricity and network connectivity, so the focus of implementation has been on urban areas, exacerbating the gap in learning opportunities, known as the digital divide. Can't Wait to Learn addresses these challenges by design by functioning offline and using solar energy, thus ensuring access to quality learning even in off-grid areas. However, the success of implementation also depends on teachers' technological capacity. The PNAs across all three countries highlighted the pressing need to strengthen teachers' technological skills, as their ability to manage digital tools is critical to effective implementation and scaling in both urban and rural settings. Education innovations designed with these needs in mind can significantly improve access to education while supporting teachers' professional development.

Government policy on EdTech is an indicator of readiness to scale
The PNA revealed that countries with established or emerging EdTech policies show greater readiness for scaling EdTech solutions as they indicate significant government dedication to integrating EdTech into the national education system. Having robust and stable policy frameworks is crucial for guiding development, providing clear directives, and promoting collaboration among stakeholders to successfully scale EdTech innovations. For example, Uganda's Education Digital Agenda Strategy 2021-2025, aligned with the country's National Development Plans II and III, demonstrates significant governmental commitment to integrating ICT in education to enhance learning outcomes (Ministry of Education and Sports, 2024). This contrasts with Chad's lack of such policies and agenda, indicating lower readiness and more focus on other educational priorities. Sudan falls in the middle, with a draft strategy not yet formalised due to political instability, however, shows significant governmental interest in EdTech integration.

Forging partnerships with government, private sector, and universities strengthens EdTech ecosystem
The PNAs highlighted the importance of forming strategic partnerships with government entities, the private sector, and universities to scale EdTech and enhance the EdTech network in conflict-affected countries. The Social Network Anaylses (SNAs) revealed the central role of Ministries of Education in the EdTech ecosystem across all countries due to their significant capacity to connect various types of actors. Additionally, the SNA showed that while the private sector is heavily involved in technology, it remains more peripheral within the EdTech network. Therefore, stronger collaboration with the private sector to leverage its resources and technological expertise could greatly benefit the education system and align EdTech initiatives with job market needs, fostering employment opportunities in technology-related fields. Moreover, universities often possess valuable technological knowledge and expertise. Strengthening connections with these institutions can not only bolster the EdTech ecosystem but also enhance community resilience by equipping individuals with the skills and knowledge required to maintain and adapt EdTech to evolving educational needs. The SNA suggests that governments can act as brokers and initiate more connections between the private sector, universities, and international organisations. A better-connected and strengthened EdTech network would increase coordination and communication between agencies, improve knowledge and information sharing in the education sector, and promote financial sustainability and localised adoption of EdTech initiatives.

RESEARCH FINDINGS

SCALING AND ADOPTION OF EDTECH

What is a broker in social networks?

A **broker** refers to an actor or entity that plays a central role in facilitating connections and interactions between other actors within a network. Brokers often act as intermediaries, helping to bridge gaps between groups that may not have direct relationships, and they facilitate the flow of resources, information, and collaboration within a network (Gould & Fernandez, 1989).

Capitalising on opportunities can accelerate EdTech scale-up
The PNAs identified significant opportunities to promote the scale-up of EdTech in conflict-affected countries. The global COVID-19 pandemic led to increased awareness and appreciation for distance learning through use of digital learning tools, providing a unique opportunity to advocate for and implement evidence-based EdTech solutions. Government entities and international organisations have shown growing support for EdTech initiatives, signalling a willingness to invest in and support their scale-up. In Uganda, the existing digital education agenda and the involvement of various stakeholders in EdTech partnerships, including universities, international organisations, and the government provide a strong foundation for scale-up. Moreover, increased global investment in solar energy and scalable EdTech solutions that address infrastructure barriers can offer a potential workaround for access to quality education in rural and underserved areas.

Government Adoption

Investing in a transition period is crucial
The adoption of the Can't Wait to Learn programme by the Isingiro District Local Government (DLG) required a dedicated transition period. This phase was critical for identifying and clarifying roles and responsibilities among all stakeholders, including district local government officials, teachers, headteachers, and WCA's programme staff. Prototyping research – iterative cycles of learning, adaptation and implementation - played a key role in this period –. Reflection meetings with District Government and school staff helped to identify and discuss challenges, and for the stakeholders themselves identify solutions that could subsequently be tested. This was a lengthy process but paid off by producing a feasible implementation model, run by the District Government and Schools, and a strong sense of commitment and programme ownership.

Capacity-strengthening should be centred on the local education stakeholders
For the handover of the Can't Wait to Learn programme to the DLG in Uganda to succeed, it was essential to build the capacity of local government and school stakeholders in Isingiro District, including school staff, school management committees, and parent-teacher associations. For instance, WCA developed the IT and M&E capacity of local officials and school staff as part of the transition process, ensuring they could effectively manage and implement the programme, and troubleshoot technological issues. The process also highlighted the need to redefine technical and management roles, such as the headteachers taking on teacher mentorship responsibilities, as this was more pragmatic than government officials taking this role.

Integrating processes and tools into the governance structure ensures quality
To support the Isingiro DLG manage the Can't Wait to Learn programme effectively, efforts were made to align the programme's processes and tools with the district's existing systems. This integration was intended to ensure consistency and improve overall management. However, achieving this alignment has been challenging at times, particularly in securing the time of district-level government staff. While the integration has made it easier for Isingiro DLG to adopt and utilise the processes and tools, further efforts are needed to fully achieve sustainable, district-led implementation quality.

What are the key insights from the transition process of Can't Wait to Learn to Isingiro DLG?

Marking the end of the research-backed transition period, the Isingiro DLG submitted a Continuity Plan in September 2024 to sustain Can't Wait to Learn independently, an important indicator of programme ownership and intention to maintain its sustainability. This signifies true local ownership of the programme and a key step towards the long-term sustainability of Can't Wait to Learn in Uganda and beyond. The successful district-level government adoption of Can't Wait to Learn in Isingiro District in Uganda underscores the critical role of investing in relationship-building to secure political and governmental buy-in. Champions within the national and district-level government played a pivotal role in advocating for the integration of Can't Wait to Learn into district local government systems. However, the process of scaling and institiuonalising EdTech innovations within government structures also presents persistent challenges:

- Government staff often face heavy workloads, competing priorities, extensive bureaucracy and rigid hierarchies, which can slow down adoption and implementation efforts for education innovations.
- Under-resourcing and understaffing, coupled with limited funding for ongoing programme maintenance hinder the sustained scale-up of these innovations.

Overcoming these challenges requires ongoing advocacy, relationship-building, capacity-building efforts, and long-term financial commitments to integrate education innovations into government policies and practices.

RECOMMENDATIONS FOR EDUCATION STAKEHOLDERS

For national governments

- Consider integrating EdTech into national education policy frameworks to show readiness if the existing infrastructure supports the use of digital technologies in education.
- Be proactive in appealing to the global donor community for sustained funding and resources for national adoption of programmes like Can't Wait to Learn within the education system.
- Support teachers' technological capacity strengthening by integrating EdTech into teacher training programmes to enhance sustainability of EdTech solutions and teacher professional development.
- Promote cooperation and partnerships between relevant education stakeholders, including donors, national and international NGOs, community-based organisations, and private sector companies to secure sustainable funding for the implementation and scale-up of Can't Wait to Learn and SchoolLinks.
- Invest in research to address pressing education challenges and inform evidence-based policies that support the achievement of national education priorities, fostering innovation and improved outcomes across the education system.

For district-level government stakeholders

- Integrate Can't Wait to Learn into district education plans and budgets to facilitate its adoption and management. This includes allocating financial and human resources for implementation and ensuring alignment with broader national education objectives.
- Provide ongoing supervision and monitoring of schools to ensure successful implementation of Can't Wait to Learn, including targeted support such as infrastructure resources and teacher training.
- Partner with WCA to leverage technical expertise, bidirectional learnings, and capacity-building opportunities for effective implementation and scaling.
- Collaborate with community leaders and caregivers to promote awareness and acceptance of Can't Wait to Learn, ensuring that programme reaches all children including girls and those with disabilities.
- Establish efficient communication channels within local government departments and with the national government to facilitate coordination and implementation of Can't Wait to Learn, including regular updates and mechanisms for reporting progress.
- Consult community members and leaders to ensure accurate understanding of problems at hand and engage them in collaboratively identifying solutions.

For donors and implementing partners

- Base decision-making on evidence when deciding which education innovations to invest, adopt, and scale in low-resource and fragile settings.
- Increase funding and support for evidence-based DPL programmes such as Can't wait to Learn that demonstrates effectiveness in addressing the learning crisis, particularly in conflict-affected and low-resource settings.
- Encourage coordination and collaboration among donors to maximise impact and avoid duplication of efforts in supporting DPL programmes.
- Consider sustainability aspects and the long-term impact of Can't Wait to Learn and SchoolLinks in education system strengthening and reform rather than seeing it as a bounded short-term investment.
- Invest in research and innovation to further improve and adapt education programmes like Can't Wait to Learn and SchoolLinks to diverse contexts, ensuring they remain relevant and scalable.
- Partner with WCA to ensure Can't Wait to Learn and SchoolLinks are effectively scaled and sustained, leveraging their expertise in adapting the programmes to different contexts and support long-term education reform.
- Prioritise multi-annual funding to provide organizations with the stability and flexibility needed to develop and evaluate long-term, sustainable solutions.

For researchers

- Investigate the long-term effects of education innovations by tracking learners' progress and skills development beyond immediate project timelines to understand the effects on educational attainment, skill development, and life opportunities.
- Explore how EdTech programmes enhance technological literacy for learners, teachers, and communities, and how these skills impact future educational and job opportunities.
- Design and conduct statistically powered trials to assess subgroup effects, ensuring diverse populations are considered for equitable and tailored programme scaling.
- Support capacity strengthening of education stakeholders, especially policymakers, in cost modelling and cost-effectiveness research to ensure data-driven decision-making.
- Adopt participatory and community-based methodologies in program design and evaluation to ensure more effective, inclusive, and contextually relevant outcomes that empower communities and promote sustainable solutions.

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