KNOWLEDGE PACK

Technology for Literacy

KNOWLEDGE PACK

TECHNOLOGY FOR LITERACY

WORLD BANK GROUP Education

INDEX

Introduction

What is a KP?

Knowledge Packages (KPs) are short, pragmatic guides on individual topics within EdTech, meant to provide sufficient knowledge and understanding so that non-technical stakeholders can make key planning, design, and procurement decisions for education.

They can be used as a starting point for the planning of technology deployment to improve education, especially with education ministries.

About this KP

This knowledge pack is designed to support the target audience with how to procure, adapt and implement interventions with technologies for literacy. The key objectives of this knowledge pack are to:

- Understand the existing evidence around the efficacy of using technology to promote literacy

- Gain some practical know-how around procuring technologies for literacy, evaluating and adapting them, and training teachers to effectively use them to meet learning outcomes

- Identify potential challenges and gaps in preparation for an intervention

After reading the main content of this KP, some questions might pop* :

*To know more about these questions and their answers, go to the FAQ available in the annex.

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Introduction

DESIGNING FOR INCLUSION BENEFITS ALL LEARNERS

There are other vulnerable groups who should be prioritized and taken into consideration when using technology to promote literacy. When one or more vulnerable groups is centered and prioritized, it often has ripple effects for other communities.

Women and girls	Rural communities	Out of school, FCV settings and refugees	Disabilities

Despite the rapid expansion of ICTs worldwide, women trail behind men in access and use of mobile phones, particularly in low and middle-income countries. Across Sub-Saharan Africa, women are 23% less likely to own a mobile phone than men, and the gap widens with regard to data and connectivity (UNESCO, 2014). This has serious implications for women and girls' literacy. Evidence has shown that the implementation of mobile literacy interventions at the beginning of primary education can prevent gender disparities driven by pedagogical practice (Pitchford, 2019).

Concerning gaps in connectivity are growing for rural communities globally. In least developed countries (LDCs), 17 percent of the rural population live in areas with no mobile coverage at all, and 19 per cent of the rural population is covered by only a 2G network, whereas almost all urban areas of the world are covered by a mobile-broadband network (ITU, 2020). Moreover, the unaffordability of data, gender inequity and lack of digital skills play a role in hindering the participation of rural communities in using technology for literacy development.

Technology is increasingly being utilized to provide educational opportunities to youth and their teachers in FCV, refugee and out od school contexts. Children in FCV countries face many challenges including (i) overcrowded classrooms, and (ii) under qualified, unqualified and or unpaid teachers (WB, 2020). Given these challenges, technology solutions such as providing devices to children for self-directed learning in such environments can be an important resource for children in such contexts who would otherwise not learn at all.

For learners with disabilities, accessible content and pedagogical approaches which follow universal designing for learning standards are critical to ensure quality education. There is a dearth of accessible literacy applications, particularly for learners who are deaf or hard of hearing. The challenges include the design of accessible content, procurement of assistive technologies and teacher training.

Assistive Tech KP

WHO **are the main stakeholders ?**
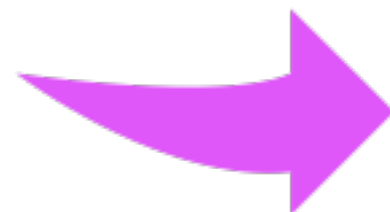
STAKEHOLDERS IDENTIFIED TO LEAD THE CHANGE

Individuals and organizations to support the main target audience as they work with education ministries to design or implement education interventions using technology to promote literacy. These might be **community-based organizations**, **non-governmental organizations** and **private sector companies with expertise** in literacy, mobile apps, accessible content, educational multimedia design, content publishing, content licensing and developing education technology products.

MAIN TARGET AUDIENCE

World Bank staff (particularly, Task Team Leaders) and **decision-makers** beyond the World Bank who support education ministries on education technology.

WHY is this KP designed ?

PROBLEM STATEMENT

It's critical for children to achieve basic literacy by the age of 10, yet this is not the reality in low-and-middle income countries where approximately 53% of children cannot understand a simple text by the end of primary school (World Bank, 2020). **Technology to promote literacy is not an all-encompassing solution, it should ideally be deployed as part of a larger literacy program which includes some of the interventions described in the WB's [Literacy Policy Package](#). Yet, there are some challenges it can help address (see the table).**

Note: Literacy apps with a strong evidence-based structure have the potential to supplement a weak curriculum.

Textbook cost and procurement	Procuring, transporting and tracking textbooks and other learning materials has traditionally been a huge cost and challenge.
Availability of content in indigenuous and local languages	Many print materials and workbooks are not available in indigenuous or local languages and are not culturally relevant, making literacy development more difficult for vulnerable groups.
Inadequate investment in teacher training	In addition to issues surrounding teacher absenteeism and shortages, teachers require more evidence-based strategies for literacy instruction in order to support students develop literacy skills.

WHY is this KP designed ?

BENEFITS

A GENERAL LOOK AT COSTS: LITERACY APPLICATIONS VS PRINTED BOOKS

Market Research across Kenya, Nigeria and Ghana.

2.18 MONTHS TO 2.5 MONTHS OR MORE	2.06 MONTHS
The average time it takes for a finished **bound book** to be printed and arrive in a publisher's warehouse for shipping (reported by 56 percent of respondents).	The average time it takes for a conversion from a print file to ebook - when a **digital book** is ready for digital distribution (reported by 55 percent of respondents citing less than a month of turnaround time).

Thus the majority of publishers reported that digital production takes less than half the time of print production and shipping to the publisher warehouse. This print production time is exacerbated by the fact that the majority of publishers are printing their books internationally. Just one third of publishers interviewed reported printing their books exclusively in their own country. The majority are outsourcing at least some portion of their printing to Asia, the Middle East, Europe, or another African country.

Source: Brown,N & Heavner, R. (2018). The State of Digital Publishing: Facts and figures from Ghana, Kenya, and Nigeria. San Francisco: Worldreader.

EVIDENCE

There is a range of evidence on the efficacy of technology to promote literacy in low and middle income countries, with a number of key factors to consider:

When provided with instruction that includes an interactive reading application, children can achieve higher gains in reading, in comparison to teacher-led, class-based practice alone (Pitchford, 2019).

Globally, literacy applications are heavily situated in the primary education space, with a predominant focus on the preschool and kindergarten audience. These applications target lower order literacy skills like phonemic awareness, alphabet knowledge and understanding upper and lowercase letters (Vaala, S., Ly, A., & Levine, M. H., 2015).

Evidence across technology for literacy instruction has also shown that more comprehensive models of teaching with technology, which include non-technology based activities are more impactful (Cheung and Slavin, 2012).

Evidence has shown that the implementation of mobile literacy interventions at the beginning of primary education can prevent gender disparities driven by pedagogical practice (Pitchford, 2019).

Mobile literacy interventions implemented well can also increase student engagement and enhance teacher technical and pedagogical practice (Wennersten et al., 2015). [India].

WHAT are the potential solutions?

STRUCTURE OF SOLUTIONS

WHAT DOES TECHNOLOGY TO PROMOTE LITERACY COVER?

Technology to promote literacy often comes in the form of mobile applications which are designed to provide learners with access to a wide variety of reading materials, stories and texts in places where books can be scarce or costly (UNESCO 2014).

Technologies to promote literacy, which often involve software and content, are designed to support the development of literacy, and can support learners acquire and strengthen their reading and writing skills, which specifically includes:

Phonics and Decoding

Phonological and Phonemic Awareness

Vocabulary

Fluency

Spelling

Reading comprehension

Writing

WHAT are the potential solutions?

STRUCTURE OF SOLUTIONS

KEYS TERMS LITERACY CONCEPTS AND TERMS INTRODUCED

Phonological and Phonemic Awareness	Phonological awareness is the ability to recognize and manipulate the spoken parts of words — including rhymes, syllables, and phonemes.
Phonics and Decoding	Children's reading development is dependent on their understanding of the alphabetic principle — the idea that letters and letter patterns represent the sounds of spoken language.
Vocabulary	Fluency is the ability to read a text accurately, quickly, and with expression. Fluency is important because it provides a bridge between word recognition and comprehension.
Fluency	Vocabulary plays an important part in learning to read. Beginning readers must use the words they hear orally to make sense of the words they see in print.
Spelling	Comprehension is the reason for reading. Good readers think actively as they read. They use their experiences and knowledge of the world, vocabulary, language structure, and reading strategies to make sense of the text.
Reading comprehension	Learning to spell is built on a child's understanding that words are made up of separate speech sounds (phonemes) and that letters represent those sounds.
Writing	A child's writing development parallels their development as a reader. Writing is a complex task that balances purpose, audience, ideas and organization with the mechanics of writing (sentence structure, word choice, spelling).

WHAT **are the potential solutions?**

STRUCTURE OF SOLUTIONS

ASSISTIVE TECHNOLOGY AND INCLUSIVE EDUCATION

There is one key difference in technologies for literacy that you will find on the market, and they come down to technologies which support core content needs and supplemental content.

CORE CONTENT (aligned to curriculum)

- Curriculum-based instruction/teacher led

- Established learning goals

- Clear sequence of concepts that build on each other in difficulty

- Indicators of progression which support educators evaluate if students are successfully attaining core reading and writing competencies

SUPPLEMENTAL CONTENT

- Content-based vs. concept/goal-based

- Often lacks assessments or evaluation component for the content

- Supports reading at home

When reviewing literacy applications, it's critical to understand the differences between applications which contain core literacy content and supplemental content.

WHAT **are the potential solutions?**

STRUCTURE OF SOLUTIONS

TECHNOLOGY MODELS

Solutions for literacy have different technological solutions that are important to take stock of for your a given context.
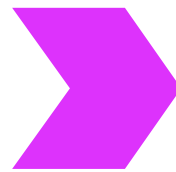
Web-based solution	• Worldreader (browser and Android-based)

Software-based solution	• Feed the Monster (smartphone devices)

All-in-one hardware and software based solution	• Onebillion, CWTL and Kitkit School (custom built hardware and software)

are the potential solutions?

STRUCTURE OF SOLUTIONS

INTERVENTION MODELS

Solutions for literacy have different intervention models and pedagogical strategies. These are two core examples (there are others).

Facilitator-led COVID Model (Classroom-based)

Can't Wait to Learn is a self-paced game for out-of-school children.

- **Model:** Groups of 5-10 students/facilitator with a rotation model (COVID model). 45 minutes a day, 3 days/week.

- **Deployments:** Sudan, Lebanon, Uganda, Chad.

- **Devices:** Tablets only.

NOTE: Can't Wait to Learn is both a facilitator-led and at-home solution.

Self-paced (At-home)

KitKit School is a self-paced application (with games).

- **Model:** 30 minutes of independent learning everyday for 3-15 months.

- **Deployments:** Tanzania, Uganda

- **Devices:** Tablets only.

NOTE: KitKit School is both a facilitator-led and at-home solution.

WHAT **are the potential solutions?**

CHALLENGES AND TRADE-OFFS

CHALLENGE	EVIDENCE
Aligning literacy goals and technology	Many technologies to promote literacy are not designed against standards for educational quality or child development, do not leverage nationally recognized curricula and do not undergo extensive research testing (Vaala, S., Ly, A., & Levine, M. H., 2015). Without understanding the pedagogical goals per grade or school level, there will be a big mismatch between a literacy application chosen for an intervention and the needs of learners.
Linguistically and culturally irrelevant content	While some technologies to promote literacy are designed to be available in multiple languages, many do not factor in how they might be used in various cultural contexts. The appropriate localization of a high-quality literacy application requires many moving parts and usually requires recruiting local expertise and talent for adaptation (Nag, Snowling, & Asfaha, 2016). If a literacy app is not appropriately localized, it will not reflect the cultural context and can create confusing and less meaningful experiences for learners (ex. Cambodia).
Limits in pedagogical design of mobile literacy interventions	Technologies to promote literacy can have limited pedagogical design and lack a variety of functionalities to support scaffolding, social learning, collaborative play, intergenerational engagement, content creation and sharing, co-use, etc. (Vaala, S., Ly, A., & Levine, M. H., 2015). Teachers and parents are not always equipped with the skills to support students use literacy applications in the classroom or at home. Moreover, many literacy applications challenge learners with boolean type prompts and gamification mechanisms such as puzzles, quizzes and games versus open-ended designs (Vaala, S., Ly, A., & Levine, M. H., 2015).

WHAT are the potential solutions?

WHAT HAS BEEN DONE IN OTHER COUNTRIES

SPOTLIGHT : PHILIPPINES

Philippines, Asia
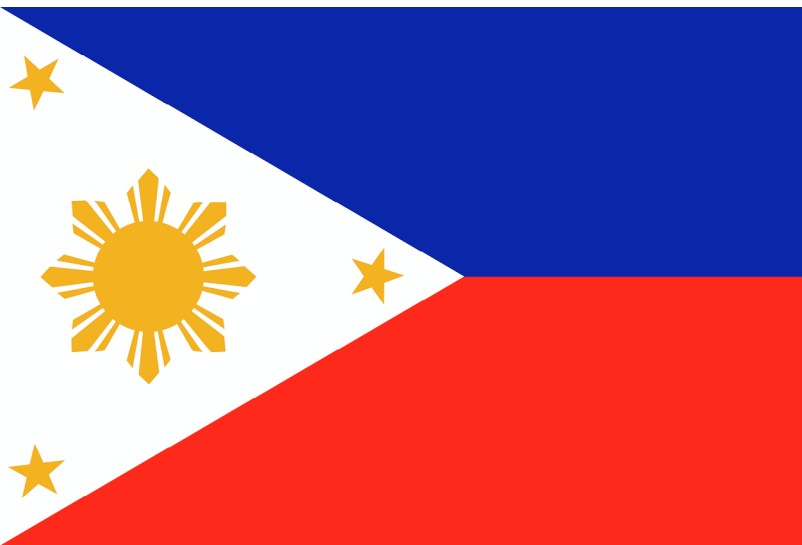
"ELLN Digital" (short for Early Language, Literacy and Numeracy) is a program created by the Philippines DepEd and TPD@Scale. It is a guided independent study designed for K to 3 teachers which leverages multimedia courseware, classroom application and reflection, and face-to-face co-learning in school-based learning communities to support the fundamentals of teaching reading and arithmetic.

In 2019 ELLN Digital began a two-year national rollout in more than 38,000 public (government-run) primary schools, targeting over 300,000 teachers (TPD@Scale). The ELLN Digital model is also currently being adapted and piloted for in-service teacher training at scale in Ghana, Honduras, and Uzbekistan.

WHAT HAS BEEN DONE IN OTHER COUNTRIES

SPOTLIGHT : JORDAN

Description

Feed the Monster is a game-based literacy app designed to build the foundational literacy skills and psychosocial health of children in crisis contexts. The game provides children with different levels of play to collect, hatch and grow pet monsters while learning how to read and write in their mother tongue language.

Children are engaged in a journey of hope and discovery, and tasked with finding the eggs and feeding them with letters, syllables and words to hatch and evolve (Koval-Saifi, N., & Plass, J., 2018). Data shows that children with previous exposure to basic literacy are able to reinforce their already acquired skills

through the game (Koval-Saifi, N., & Plass, J., 2018).

Originally designed for Syrian refugees, the creation of the game catalysed the independent localization into over 50 language versions downloaded in over 120 countries, all free, creative commons and open source.

Strategies they used :

- Students learn through a sequential knowledge-building process designed and facilitated by a teacher

- The application has a clean and easy to use interface, which supports students

- navigate the scaffolding and stay motivated

- Within the application, students receive positive reinforcement, and it clearly communicates progress through rewards and incentives

Photo credit: World Bank

Key Ingredients for a Successful Intervention with technology to promote literacy

EVALUATING AND PROCURING TECHNOLOGY AND CONTENT TO PROMOTE LITERACY

DEPLOYMENT

WHO DO YOU NEED ON YOUR TEAM?

- Literacy expert
- Procurement expert with expertise in textbooks and literacy materials
- Learning designer
- Data scientist/analytics expert

DEPLOYMENT PLANNING

#1: Which grade levels is your intervention targeting? What are the core pedagogical goals around literacy for those grade levels? Review the **Early Grade Reading Rainbow framework** to identify the target skills learners need to acquire for the grade level.

#2: What are your educational objectives and needs based on the target audience? What do you want to achieve with the selected technologies for literacy? Work with government partners to conduct a **needs assessment for the target audience**.

EARLY GRADE READING RAINBOW FRAMEWORK

The Early Grade Reading Rainbow applies to many alphabetic languages but not all. It is not meant to be an all encompassing tool. Some of these guidelines may not apply to character-based languages.
Students should learn:

Lots of spoken words, and how to use them

To hear and make the sounds that make up words

To map sounds to letters, and understand that letters can be used to write any word

To automatically recognize written words plus their roots, parts, and meanings

To read and write longer chains of words, increasingly smoothly and automatically

To understand the meaning of any text read

To enjoy reading independently and read-to-learn continuously

EVALUATING AND PROCURING TECHNOLOGY AND CONTENT TO PROMOTE LITERACY

GLOBAL PROFICIENCY FRAMEWORK FOR READING

In addition to the Reading Rainbow, the GPRF is another useful tool framework with clear indicators for reading skills for grades 1 through 9. To learn more by grade level, visit the website here.

An "x" means there are global proficiency descriptors (GPDs) for the grade in question. If there is no "x," that means there are no GPDs for that grade level. Learners have either developed the knowledge and skills for these subconstructs at earlier grade levels, or they are not yet ready to demonstrate this knowledge or skill.

Domain	Construct		Subconstruct		1	2	3	4	5	6	7	8	9
C Comprehension of spoken or signed language	C1	Retrieve information at word level	C1.1	Comprehend spoken and signed language at the word or phrase level	x	x							
			C1.2	Recognize the meaning of common grade-level words in a short, grade-level continuous text read to or signed for the learner	x	x							
	C2	Retrieve information at sentence or text level	C2.1	Retrieve explicit information in a short grade-level continuous text read to or signed for the learner	x	x	x						
	C3	Interpret information at sentence or text level	C3.1	Interpret information in a short grade-level continuous text read to or signed for the learner		x	x						
D Decoding	D1	Precision	D1.1	Identify symbol-sound/fingerspelling and/or symbol-morpheme correspondences	x	x	x	x	x	x	x	x	x
			D1.2	Decode isolated words	x	x	x	x	x	x	x	x	x
	D2	Fluency	D2.1	Say or sign a grade-level continuous text at pace and with accuracy		x	x	x	x	x	x	x	x
R Reading comprehension	R1	Retrieve information	R1.1	Recognize the meaning of common grade-level words	x	x	x	x	x	x	x	x	x
			R1.2	Retrieve explicit information in a grade-level text by direct- or close-word matching		x	x	x	x	x	x	x	x
			R1.3	Retrieve explicit information in a grade-level text by synonymous word matching			x	x	x	x	x	x	x
	R2	Interpret information	R2.1	Identify the meaning of unknown words and expressions in a grade-level text			x	x	x	x	x	x	x
			R2.2	Make inferences in a grade-level text			x	x	x	x	x	x	x
			R2.3	Identify the main and secondary ideas in a grade-level text			x	x	x	x	x	x	x
	R3	Reflect on information	R3.1	Identify the purpose and audience of a text			x	x	x	x	x	x	x
			R3.2	Evaluate a text with justification			x	x	x	x	x	x	x
			R3.3	Evaluate the status of claims made in a text						x	x	x	x
			R3.4	Evaluate the effectiveness of a text								x	x

to implement next steps ?

EVALUATING AND PROCURING TECHNOLOGY AND CONTENT TO PROMOTE LITERACY

EARLY GRADE READING RAINBOW FRAMEWORK: HOW TO SELECT A LITERACY APP

STEP 1	STEP 2	STEP 3	STEP 4

STEP 1

Identify the grade or school level (s)

- ECD
- Early grade
- Grades 1-3
- Post-early grades

STEP 2

What skills should learners acquire according to grade level?

Review the Early Grade Reading Rainbow Framework

STEP 3

How do learners acquire these skills? What are the core pedagogical tasks or goals?

- Phonological and phonetic awareness?
- Smoothness in word and phrase reading?
- Additional vocabulary building/deepening?
- Writing comprehension?

Review the Early Grade Reading Rainbow Framework

STEP 4

Start sourcing and evaluating literacy apps with these sites:

- Children's Technology Review
- Digital Storytime
- Common Sense Media

to implement next steps ?

EVALUATING AND PROCURING TECHNOLOGY AND CONTENT TO PROMOTE LITERACY

EARLY GRADE READING RAINBOW FRAMEWORK: HOW TO SELECT A LITERACY APP

Grade or School Level	Early Grade Reading Rainbow Statement ("Students should learn to")	Core pedagogical task or goal	Technology Examples
ECD	Lots of spoken words, and how to use them	(1) Oral language comprehension (2) Phonological and phonetic awareness (3) Writing exercises (e.g. students learn to hold a pen, make lines, etc.)	Worldreader
Early grade (Explicit Reading Instruction) **Grades 1-3 (possibly up to grades 5-6)**	(1) Hear the sounds that make up words (2) Map sounds to letter, and know that letter can be used to write any word (3) Automatically recognize written words plus their roots, parts, and meaning	(1) Phonological and phonetic awareness (2) Phonics activities (3) Fluency (4) Vocabulary building (5) Reading comprehension (6) Writing exercises (e.g. students move from learning to write individual letters, to 'invented spellings')	Feed the Monster; Antura and the Letters
Post early grade (Read-to-learn and write phase)	(1) Read and write increasingly longer and harder chains or words, increasingly smoothly and automatically (2) Under the meaning of any text read (3) Enjoy reading and read-to-learn for life!	(1) Additional vocabulary building/deepening (2) Reading comprehension (3) Writing exercises (e.g. transition to writing more complicated texts (connected texts, paragraphs, dialogue, etc). (4 Enjoy reading and writing, and use it to achieve goals	Storyweaver

EVALUATING AND PROCURING TECHNOLOGY AND CONTENT TO PROMOTE LITERACY

WHAT TO LOOK FOR IN A LITERACY APP

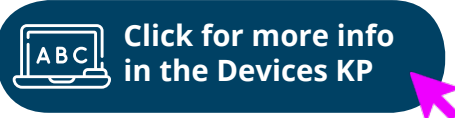| READING LEVEL	GOALS	SEQUENCE OF CONCEPTS	LITERACY APP EXAMPLES
Emergent reading (0-4)	Code-related skills: • Oral language and comprehension • Phonological and phonetic awareness • Writing	1) Finding all the objects or words on a page that begin with a certain letter (sound). 2) Rhyming games using the words in the story. 3) Grouping objects according to how their names begin (letter, sound). 4) Games that pronounce each phoneme and highlights each letter.	**Alphabytes:** helps children learn their letters, the sounds letters make, how to write both upper and lower case letters and how to spell a few words. **Bob's Books Reading Magic:** Teaches the sounds that letters make and how to combine them to make short words.

Source: "Enhancing Children's Literacy Skills" (Long et. al., 2017).

EVALUATING AND PROCURING TECHNOLOGY AND CONTENT TO PROMOTE LITERACY

IMPLEMENTATION STEPS

STEP	DESCRIPTION	RESSOURCE
#1: Effectively source technologies that promote literacy.	The market is flooded with applications which claim to promote literacy, and are not aligned to specific educational targets per grade level or curriculum standards. It can be challenging to source literacy applications and it's important to us resources which provide reviews and ratings. For all-in one technology and hardware solutions, it's especially important to **consider hardware solutions which are already ubiquitous and accessible for learners**. Click for more info in the Devices KP	Children's Tech is a great resource for identifying literacy apps according to grade level and reading skills targeted.
#2: Review existing evidence and research testing.	When sourcing literacy applications, it's critical to focus on a needs-oriented approach, rather than the more common solution-oriented approach which is not evidence-based. Review any existing evidence of learning outcomes, and when that data is not available, look for data around how the literacy application has been designed to incorporate (or not) literacy standards. When sourcing literacy applications, review any data on research testing and design processes.	Check out Five Questions Everyone Should Ask Before Choosing Early Literacy Apps produced by the Joan Ganz Cooney Center.
#3: Conduct a market analysis.	Once you've identified a set of technologies which are aligned to curriculum standards and can meet the needs of the target learners, conduct a market analysis to compare costs. Factors might include content and subscription costs, adaptation needs, and training needs according to implementation models.	The Joan Ganz Cooney Center has modeled a good format to evaluate literacy apps for Education.

to implement next steps ?

EVALUATING AND PROCURING TECHNOLOGY AND CONTENT TO PROMOTE LITERACY

PITFALLS TO AVOID

LEAD LITERACY INITIATIVES INCONSISTENT WITH RESEARCH	**FAIL TO DISTINGUISH SUPPLEMENTAL CONTENT FROM CORE LITERACY CONTENT**	**DISREGARD DATA COLLECTION FOR JUST-IN TIME LEARNING**	**ACCESS TO BOOKS DOES NOT EQUAL LITERACY**
Designing an intervention with a literacy application which is not aligned with research and the targeted grade level may fail, regardless of how robust the application is and the features it might possess. It's important to first consider the grade level, the targeted competences and begin sourcing literacy applications for review with that data.	Many literacy applications, particularly for post early-grade reading contain supplemental literacy content, not core literacy content. It's important to understand how to identify the two and select the type of content which meets the needs of your intervention.	Teachers and administrators need a robust data collection plan for formative assessment. Work with government partners in the early stages of planning to establish what types of data should be collected, aligned to literacy standards and how data analytics can be leveraged throughout the intervention to support just-in time learning.	Providing learners with mobile books or content is simply providing access. It is critical not to conflate access to books with literacy or even the promotion of literacy. There a number of other factors aside from access which are necessary to design a successful literacy intervention.

Traps to avoid along the way

EVALUATING AND PROCURING TECHNOLOGY AND CONTENT TO PROMOTE LITERACY

PATHWAYS FOR DECISION-MAKING

YES, BUT THEY REQUIRE ADAPTATIONS

Do you have budget allocation/funding for the adaptations?

YES
Consider how you will prioritize adaptations according to learner needs and required resources.

NO
Evaluate if you can use aspects of the solution and/or fundraise for the critical adaptations.

Are there literacy applications in the global or local market that can meet some or all needs of the target learners?

**NO,
THEY ARE NOT**

Do you have budget allocation/funding to build a custom solution?

YES
Consider reaching out to local content publishers and technology designers to build a custom solution.

Determine how involved you want to be in the creation process (ex. script development, content testing, etc.).

NO
Consider a more low-cost literacy intervention.

ADAPTING TECHNOLOGIES AND CONTENT TO PROMOTE LITERACY
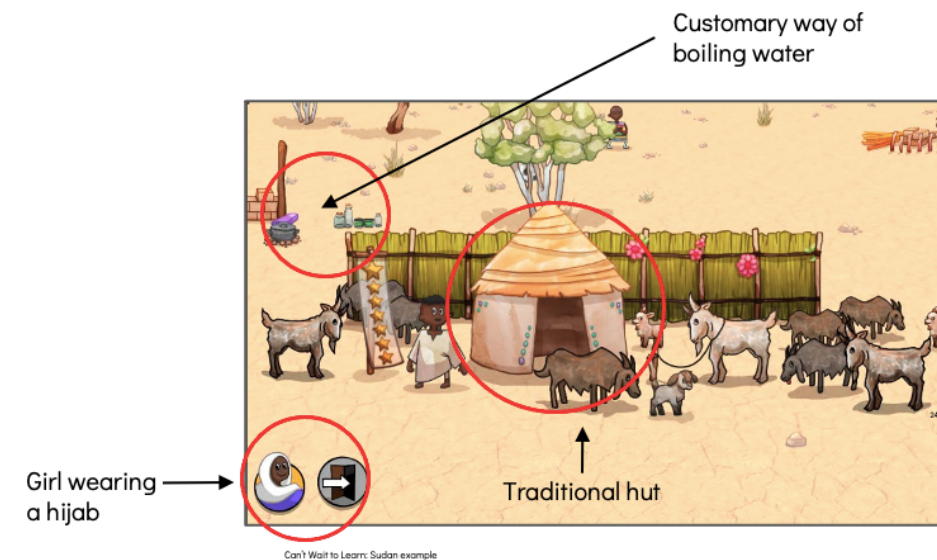
DEPLOYMENT

WHO DO YOU NEED ON YOUR TEAM?

- Literacy expert
- Multimedia expert
- Procurement expert
- Ethnographic researcher

Customary way of boiling water

Girl wearing a hijab

Traditional hut

Can't Wait to Learn: Sudan example

This is an image capture from the literacy game Can't Wait to Learn created for Sudan.

In the image capture, it's clear that in addition to language, the characters, environment, food, style of dress and overall way of life has been created to represent the local context.

DEPLOYMENT PLANNING

#1: Before you engage in planning for content adaptations, it's critical to evaluate open-source and proprietary solutions, the types of permissions you will need to modify content, and the implications around costs. This can have a dramatic impact on the sustainability of your project if not considered ahead of procurement.

#2: Once you've selected a technology that can support literacy development, identify communities of students and teachers with whom you can can conduct user research and testing. It's best to conduct user testing with the target communities to determine what types of adaptations or additional content may be necessary to meet educational needs.

#3: Take stock of the resources you may need for adaptations and your budget. Necessary resources may include multimedia production, accessible content production, etc.

ADAPTING TECHNOLOGIES AND CONTENT TO PROMOTE LITERACY
IMPLEMENTATION STEPS

STEP	DESCRIPTION	RESSOURCE
#1: Conduct user research for localization.	It's critical to conduct user research with target learners, teachers and other stakeholders who need to be represented in the localized version of the application. Testing sessions with the existing application, focus group discussions with target users and observations of how they use the app are all good qualitative methods to help inform the key priorities for localization, which will enhance the learning experience for literacy. Work with government partners to gather the needs and perspectives of the target community through user research methods.	Take a look at Curious Learning's Localization Guide, and how to keep costs low with their design for localizability worksheets.
#2: Provide context appropriate content and linguistics.	Literacy content must be relevant to learners culturally and linguistically in order to support literacy goals. There are high-quality literacy apps and literacy content that can be localized to meet your context, and it's important to consider the cost-benefit analysis before moving forward. Prioritize the key adaptations of the literacy application for targeted learning outcomes, and hire local talent for this customization work.	Check out IDEO's Field Guide to Human-centered design, which includes user research strategies.
#3: Localization Partnerships.	Engage in a localization process which draws from the expertise of actors like Creative Commons and Wikimedia, who know how to mobilize place-based content communities. This can also keep costs low, support the growth of the local ecosystem and contribute to open source efforts. Before moving forward with fully customizing a literacy application, conduct user testing session and focus group discussions of a small sample to ensure it will meet literacy goals.	Take a look at Wikimedia's localization and internationalization work.

ADAPTING TECHNOLOGIES AND CONTENT TO PROMOTE LITERACY

PITFALLS TO AVOID

PROCURE LITERACY APPS THAT ARE EXPENSIVE AND DIFFICULT TO LOCALIZE	**INVEST IN LANGUAGE TRANSLATION AND NOT CULTURAL TRANSLATION**	**CONDUCT LOCALIZATION WORK UNINFORMED BY HYPERLOCAL CULTURE**	**FAIL TO CONDUCT USER TESTING BEFORE INVESTING IN LOCALIZATION**
Literacy apps do not automatically transfer between contexts. Procuring a literacy application that may have good content but is expensive or challenging to localize due to the nature of the content or the learning design may not be the best investment. Conduct a cost-benefit analysis of localization before engaging in procurement.	Literacy applications not only require the translation of spoken and written language. To be truly effective, they should also undergo adaptation to represent a new local context. This may mean the creation of new assets within the application, which would include storylines, types of characters, environments, etc.	If a mobile literacy intervention is being conducted in a rural area, a literacy application which represents the culture and customs of an urban area will be irrelevant and confusing for learners. Drawing from hyperlocal culture is key to engaging learners in literacy content and keeping learners motivated.	The localization and adaptation of a literacy application can become more costly than necessary if assumptions are not tested with users. Engage in a full design cycle (understand, define, brainstorm, prototype, test) and test with a diverse set of learners and teachers to ensure a broad range of needs are considered.

Traps to avoid along the way

TRAINING TEACHERS AND OTHER STAKEHOLDERS TO USE TECHNOLOGY TO PROMOTE LITERACY

DEPLOYMENT

WHO DO YOU NEED ON YOUR TEAM?

- Literacy expert
- TPD trainer
- Data scientist

DEPLOYMENT PLANNING

#1: It's important to understand and take stock of teachers general digital literacy skills, which will vary across contexts (ex. urban vs. rural). Survey teachers within the target audience to understand how comfortable they are with technology, prior experience and training, knowledge of devices and how to troubleshoot, etc. This information will be critical in designing teacher professional development.

#2: Before embarking on teacher training, ensure you have worked with government partners to design a feedback loop which incorporates teacher and student feedback from using the selected technology, so that this feedback goes directly back into improving every aspect of implementation (ex. technology selection, customization, teacher training). Teachers will need this information clearly laid out during training so that they understand what type of feedback/data to collect, how and where it should be sent.

HOW to implement next steps ?

TRAINING TEACHERS AND OTHER STAKEHOLDERS TO USE TECHNOLOGY TO PROMOTE LITERACY

IMPLEMENTATION STEPS

STEP	DESCRIPTION	RESSOURCE
#1: Provide leveling and scaffolding.	Support teachers understand how to customize or scaffold technology experiences according to student level of ability.. When scaffolding is not available, learners can veer off task and fail to complete targeted activities to build their literacy skills. Moreover, if students engage with themes or interactive content that do not align with their learning needs or level, it can negatively affect story comprehension (Bus et al. 2015).	Reading Rockets has a comprehensive list and examples of literacy apps which are designed with appropriate scaffolding.
#2: Train teachers and administrators on how to interpret data for pedagogical decision-making.	Data captured on technologies for literacy, like time on task , can support teachers make better pedagogical decisions for their students. Teachers and administrators need the skills to understand how to act on specific types of data and how it ties back to pedagogy. It's also important to support teachers understand how to make these decisions in real-time.	Learn more Bridge IT's teacher PD approach in India for mobile video content.
#3: Adapt existing strategies and resources to support families and reading at home initiatives.	Families play a critical part in supporting literacy goals. Support teachers with strategies to work with the families of their students to boost reading at home. A study in the United States found that over the five years before entering kindergarten, children from literacy-rich homes hear approximately 1.4 million more words from reading time than children who are never read to (Logan, J. A., Justice, L. M., Yumus, M., & Chaparro-Moreno, L. J., 2019).	Check out the National Center on Improving Literacy's families and school's partnering toolkit.

TRAINING TEACHERS AND OTHER STAKEHOLDERS TO USE TECHNOLOGY TO PROMOTE LITERACY

PITFALLS TO AVOID

FOCUS ON CONSUMPTION VS. PRODUCTION OF KNOWLEDGE	**FAIL TO STRENGTHEN TEACHERS' DATA LITERACY SKILLS**	**ASSUME THAT THERE IS A TEACHER PD COMPONENT**	**ASSUME THAT THE TEACHERS AND CAREGIVERS HAVE BASIC DIGITAL LITERACY SKILLS**
A large proportion of educational apps focus on the consumption rather than production of knowledge, (Pegrum et al., 2013), and do not tap into the range of possibilities afforded by multiple literacy theories. Creative literacy apps designed for writing and sharing digital stories can allow more transformative practice (Oakley, 2017).	In order for students literacy skills to develop, teachers and administrators need capacity-building around data literacy to improve their overall practice and student outcomes. This includes understanding data analytics, synthesizing the information and making a plan for how to apply that to daily lesson planning and instruction.	Teachers need TPD opportunities focused on literacy instruction and pedagogical design to achieve learning outcomes with mobile literacy applications. TPD is ideally continuous and fosters communities of practice. When teachers receive in-classroom feedback and targeted coaching, they can rapidly accelerate positive practice (see Philippines' example).	Teachers may have low levels of digital literacy and need training on how to operate and troubleshoot issues around software applications (how to install, update, etc.) and devices, and how to efficiently and safely charge and store devices.

Traps to avoid along the way

Conclusion

CALL TO ACTION

- Access to and the affordability of materials for literacy is a priority to ensure equity, reduce learning poverty and achieve SDG4: **'Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all'**.

WHERE TO START ? RECOMMENDATIONS

1. Review the implementation slides to start building a work plan.

2. Assess how many learners can be reached with technologies for literacy, and consider internet penetration rates and device usage.

3. Conduct a needs assessment for the target learners and conduct a market analysis of the technologies for literacy which are available, contextually appropriate and within your budget.

4. Create buy-in and build a case to invest in technologies for literacy.

Photo credit: World Bank

Conclusion

WHO

World Bank staff (particularly, Task Team Leaders) and **decision-makers** beyond the World Bank who support education ministries on education technology.

WHY

Technologies which promote literacy are **not an all-encompassing solution**, but they can **address challenges** such as **textbook cost and procurement**, **culturally relevant and accessible content**, and **pedagogical training for teachers.**

WHAT

Technologies to promote literacy, which often involve software and content, are designed to support the development of literacy, and can **support learners acquire and strengthen their reading and writing skills**, which includes: **phonics, reading comprehension and read aloud, blending** (combine sounds to form words), **vocabulary** and **sentence building**.
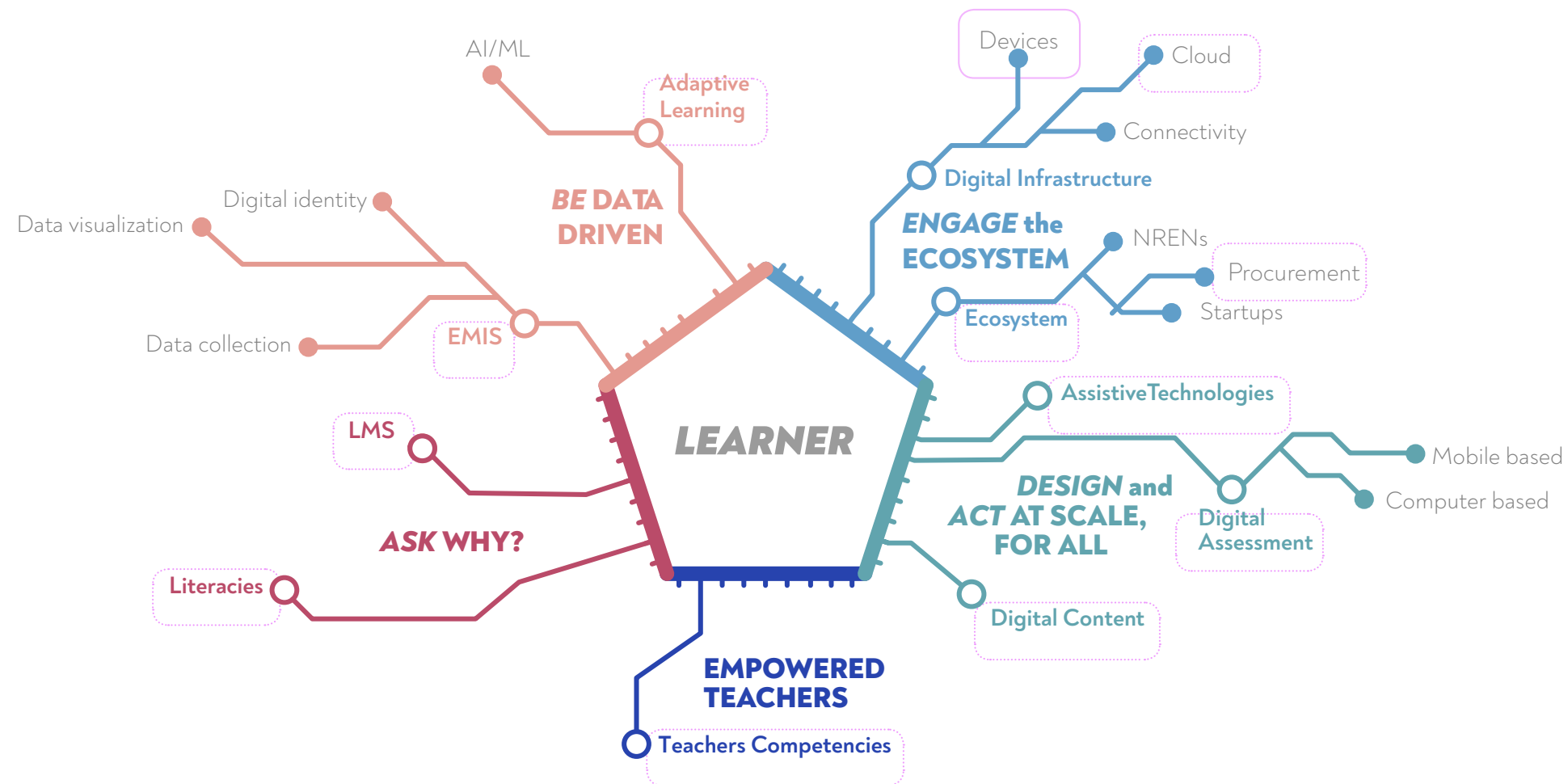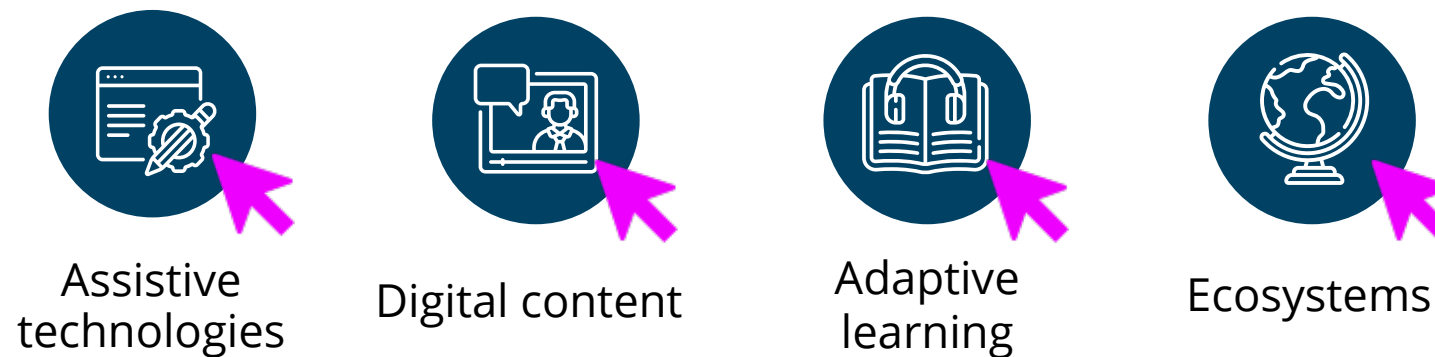
HOW

The **key ingredients** for a successful intervention with technologies to promote literacy include **evaluation and procurement**, **adaptation** and **teacher training**.

To go further

CLOUD OF KPs

**OTHER EXISTING
RELATED KPs**

Assistive technologies

Digital content
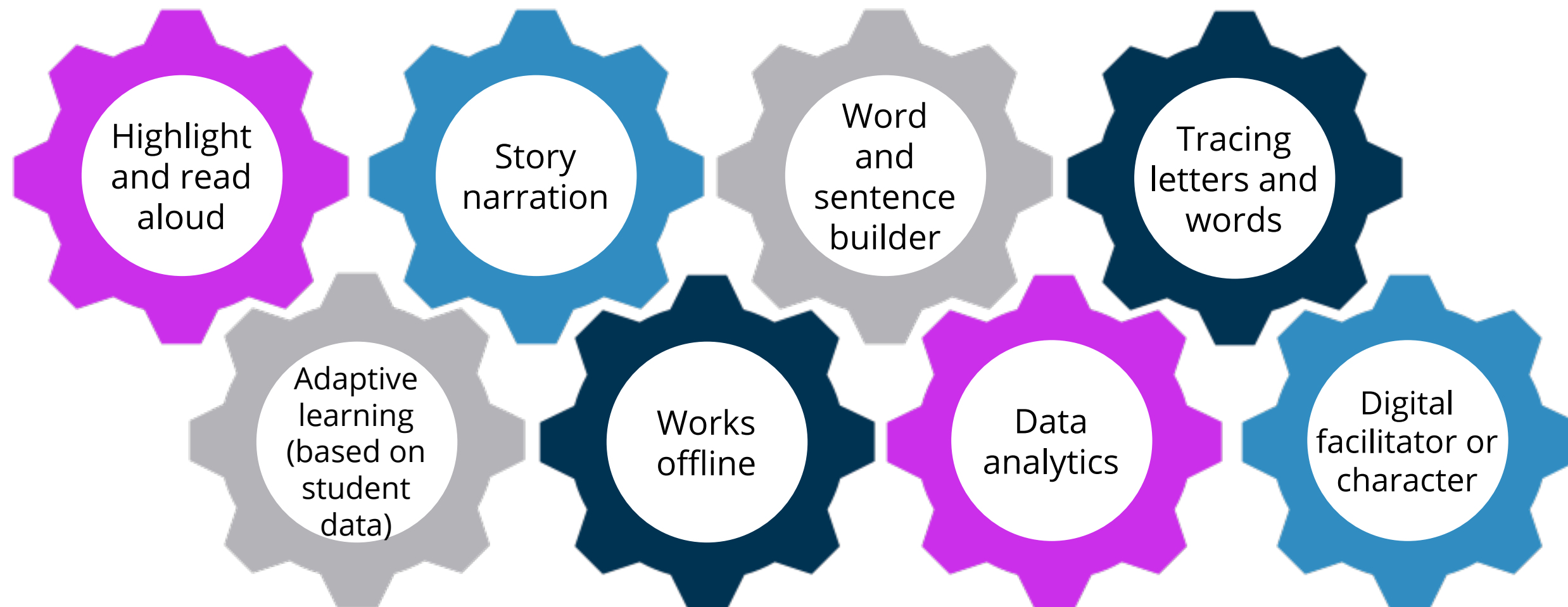
Adaptive learning

Ecosystems

Annexes

FAQ

Annexes

FAQ

What are some common features of technologies to promote literacy?

There is one key difference in technologies for literacy that you will find on the market, and they come down to technologies which support core content needs and supplemental content.

Highlight and read aloud

Story narration

Word and sentence builder

Tracing letters and words

Adaptive learning (based on student data)

Works offline

Data analytics

Digital facilitator or character

Annexes

FAQ

💬 **Why is important to use literacy apps that are available in mother tongue/ local languages?**

It cannot be understated how important it is to procure literacy applications which provide learners content in their mother tongue/local language. This means that written, spoken and any visual content embodies idiosyncrasies of the language, represents cultural values, the way of life and overall context.

Research illustrates that engaging children in school through mother-tongue based, multilingual education (MTB-MLE) can be a successful model (Benson & Kosonen, 2013; Yiakoumetti, 2012). The following literacy applications have been used for mother tongue education.
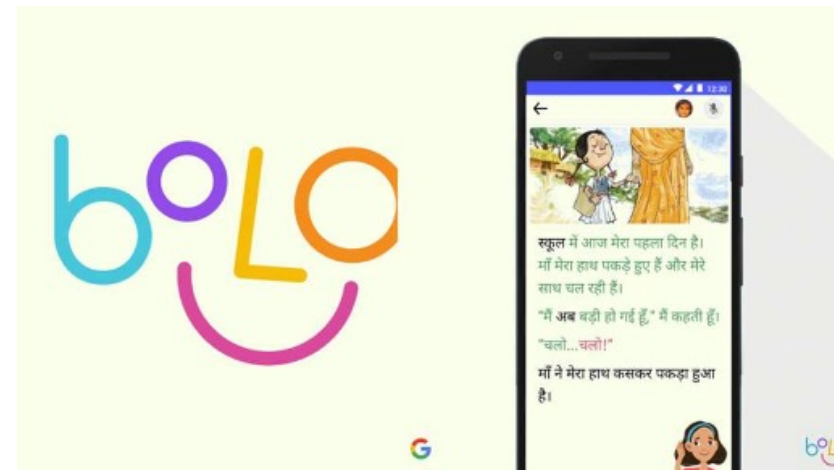
Bolo: Hindi language app (India)

Lijoch: Amharic language app (Ethiopia)

Mzanzi Kids: Available in 6 South African languages

Annexes

FAQ

Which are some of the most popular literacy applications?

This list is not exhaustive, but includes common literacy applications and others identified by the EdTech Team.

Literacy Application	Software License	Countries of Deployment	Core or Supplemental
Feed The Monster	Open Source	Nigeria, South Africa, TBD	Core and Supplemental
Can't Wait to Learn	Proprietary	Uganda, South Sudan	Core (aligned to curriculum)
Leap Learning	Proprietary	Ethiopia, Uganda, Gambia, Malawi	Core (aligned to curriculum)
KitKit School	Proprietary	Kenya	Core (aligned to curriculum)
Onebillion onetab	Proprietary	Malawi, Tanzania, Kenya, Uganda	Core (aligned to curriculum)
Mzanzi Kids	Proprietary	South Africa	Supplemental
Lijoch	Proprietary	Ethiopia	Supplemental
African Storybook	Open Source	South Africa	Supplemental
Worldreader	Proprietary	Ghana, Kenya, South Africa	Supplemental

Annexes

FAQ

What are some examples of implementation of literacy apps? 1/2

SPOTLIGHT : CAN'T WAIT TO LEARN (Uganda, Sudan, Chad Jordan, Lebanon)

Description

Can't Wait to Learn is a games-based learning application for out-of-school children which works offline and aligned to the national curriculum. The games' video, graphics, audio and other aesthetic elements are designed to be culturally-relevant. It is currently used in accelerated education programmes, basic literacy & numeracy programmes as well as in the formal school system.

CWTL has been designed with target communities to meet the needs around cultural representation. Various aspects of the game including the storyline, characters and settings are created with inputs from children, and visual assets are developed by a local designer

(War Child Holland, 2018). Children are involved throughout the process and provide feedback on future iterations.

CWTL also features young people and other culturally-appropriate role models children can identify with and look up to, which acts as a motivating feature (War Child Holland, 2018).

Strategies they used :

- Steeped their approach in games-based learning and literacy theory before engaging in the design process

- Co-designed with the target audience to ensure the game is contextually relevant and corresponds to the children's realities and dreams

- Hired local talent to create culturally relevant content for the application

Photo credit: World Bank

Annexes

FAQ

What are some examples of implementation of literacy apps? 2/2

SPOTLIGHT : WORLDREADER - INSPIRE US PROJECT (West Africa)

Description

IN 2019, the **Inspire Us West Africa** project focused on creating a digital collection on the Worldreader App of thirty stories featuring Ghanaian and West African women role models.

The project reached **over 787,000 people** through social media platforms, and attracted **over 28,000 readers** to the Worldreader App from West African countries.

The Inspire Us digital collection demonstrated a strong correlation that if offered relevant and engaging content, users read more and more often. Readers averaged four hours reading per month, with the **top 25% of readers spending an average of 23 minutes reading per day**, with the highest reader engagement from Nigeria.

Strategies they used :

- A **writing competition** to develop books focused on women's empowerment from West African authors

- Leveraging **libraries and book clubs to engage young women** between the ages of 15 and 24 on conversations around gender equality and women's empowerment.
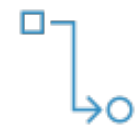
- A **wide-spread social media campaign** leveraging Facebook, Twitter and Instagram, throughout West Africa to promote the collection to youth across the region.
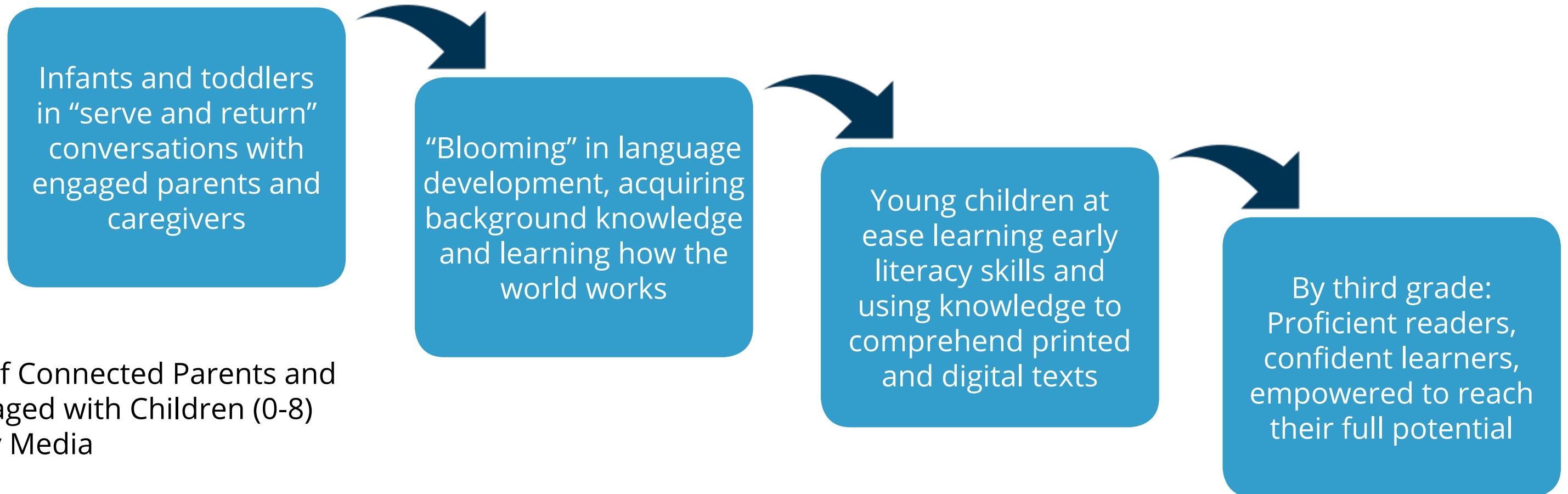
Annexes

FAQ

What are the cascading effects of reading?

When children receive pedagogical support from teachers in the classroom and caregivers at home, this can accelerate learning gains in literacy for young children and reinforce the development of foundational skills.

CASCADING EFFECT

The Potential of Connected Parents and Educators Engaged with Children (0-8) Around Quality Media

Infants and toddlers in "serve and return" conversations with engaged parents and caregivers

"Blooming" in language development, acquiring background knowledge and learning how the world works

Young children at ease learning early literacy skills and using knowledge to comprehend printed and digital texts

By third grade: Proficient readers, confident learners, empowered to reach their full potential

Annexes

FAQ

Where can I find further resources?

> "Reading in the Mobile Era: A study of mobile reading in developing countries", UNESCO, (2014). This comprehensive report developed by UNESCO, Nokia and Worldreader explores how mobile technologies can empower readers and further literacy in developing countries.

> The GSMA Mobile Internet Skills Training Toolkit (MISTT) is a set of free resources to support communities develop basic skills to access and use mobile internet. It leverages a 'train the trainer' approach and includes short lessons in that can be easily contextualized to local needs and languages.

> The World Bank's Learning Poverty initiative uses three pillars of work: (1) a literacy policy package (2) refreshed education approach (3) ambitious measurement and research agenda. Read the country learning poverty briefs for a deep dive.