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CHALLENGES ASSOCIATED WITH READING ACQUISITION IN SUB-SAHARAN AFRICA: PROMOTION OF LITERACY IN MULTILINGUAL CONTEXTS

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The widespread persistence of illiteracy across the world deprives millions of citizens of the economic and political opportunity to secure their basic human rights. Out of 650 million children of primary school age, at least 250 million are not learning the basics in reading and mathematics (Education for All Global Monitoring Report Team, 2014)(hereafter EFA). Out of these children, 130 million had attended school for several years. In sub-Saharan Africa, one in five children was out of school in 2011 (EFA, 2014), and across Africa fewer than half of the children reach the end of primary school (Heugh, 2011). In 17 sub-Saharan countries, fewer than half of the children are learning the basics, and they are poorly prepared for transition to secondary education (EFA, 2014). Such outcomes are the rule in Africa, not the exception (as documented in several reports of the Africa Progress Panel until the end of this forum, 2017) and pose a great risk to the continent. It has, after all, a rapidly growing population of young people, all of whom need to find employment and livelihoods.

The promotion of literacy in Africa faces challenges at many levels. Universal access to education was an important objective of the decolonization movements and, indeed, these movements did trigger dramatic rises in enrolment for basic schooling across many African nations, among them Zambia. But with rapid demographic growth and economic recession, the proportion of primary-school-age children out of school began to rise again in the 1990s. By 2014 it had reached 21% in sub-Saharan Africa, with about half of the children affected not expected to ever enter school (UNESCO, 2016). In Zambia, the net enrolment ratio for primary schooling remained quite high, estimated by the World Bank as 95% in 2014 (FHI, 2016). [QUERY: NO CITE IN REFERENCES] However, the proportion of

enrolled learners attaining literacy declined. In 2007, for instance, 44% of Grade 6 learners in Zambia were assessed as functionally illiterate (Spaull, 2012¹).

Among the key causes of these circumstances, which are highly disappointing considering the massive expansion drive in education in the region, are the inadequate numbers of trained teachers², and the high child-to-teacher ratios in the early grades of urban African schools. Classes will often have 70 children to one teacher. Moreover, many African governments allocate less than 15% of their budgets to the education sector, which also needs massive expansion at secondary and tertiary levels. As a result, salaries paid to early-grade teachers in public schools are uncompetitive, and teaching conditions in the schools are poor. Furthermore, the AIDS pandemic has taken a heavy toll on the teaching workforce in several countries, including Zambia (Beyani, 2013).

Clearly, education poses numerous complex challenges in many sub-Saharan African countries. However, there are aspects of education in which a lot of progress can be made if decision makers are well informed. So far, the impact of language policy in education has not been adequately understood. Because of differences in the orthography of languages, choice of language in early literacy instruction can have a considerable effect on learning outcomes. In order to equip these countries with well-designed education policies and with good, realistic, efficient (digital instruction, as will be shown below) teacher training programmes and literacy instruction methods, it is important to note the value of scientific research on the impact of language in learning to read. Below we will illustrate the present situation in Africa, emphasizing our experience in Zambia, and discuss how new technology could be used to support literacy learning.

EFFECTS OF LANGUAGE POLICY IN LITERACY INSTRUCTION

The interconnectedness between language, communication, effective teaching and learning is currently misunderstood outside expert circles (Wolff, 2011). Africa is the only continent in which children still start school in a foreign language that their teachers might not have a competent command of (Ouane & Glanz, 2010). Challenges in increasing the literacy rates are connected to the changes made to language policy in many African countries. Use of familiar languages in education has gained momentum over the years, supported by actions such as the Asmara Declaration (2000). Use of familiar languages is an important factor for human rights and preservation of cultural values, and it promotes inclusiveness in education, as it allows children to use the language they speak (Ministry of Basic Education, Sport and Culture, 2003)

It is likely that lack of awareness as to the strong impact of language on the ability to learn to read has affected education policy. Tanzania is frequently used as an example of a country in which local languages are well recognized. Soon after

¹ These data were generated by the third round of SACMEQ, a sub-regional research collaboration among 15 countries of South-Eastern Africa, which reported a functional illiteracy rate of 18% at grade 6 across the sub-region.

² The regional student-teacher ratio in sub-Saharan Africa stands at about three times that of OECD nations in 2013 (Majgaard and Mingat, 2012)

Independence, nation-building campaigns included promoting Kiswahili as the language of public life, as well as transforming the curriculum of government schools to focus on the Tanzanian national experience. Kiswahili was, therefore, declared the medium of instruction in primary schools, and English was used in secondary and post-secondary schools. Politicians, academics and the masses have, however, been divided on the language issue. Academics and some politicians support the use of Kiswahili as the language of instruction at all levels of education as was laid down in *Sera ya Utamaduni (Cultural Policy)* (Ministry of Education and Culture, MoEC, 1997). Justifying their argument are research results, and recommendations that English as the language of instruction compromises knowledge acquisition in higher learning institutions (Qorro, 2002). Unfortunately, a second group, favouring English, had more strength, because they were backed by powerful donors (for example, British Council, USAID and the World Bank) and by parents who would prefer to send their children to schools where the language of instruction is English from Grade 1. That the schools are registered by the Ministry of Education indicates that the Ministry accepts the use of English as the language of instruction.

In Zambia, for complex historical reasons, a series of policy shifts with respect to initial literacy curriculum occurred between 1966 and 2013. In the first 30 years, irrespective of their home language, Grade 1 learners were immersed from the outset in English (McAdam, 1978; Serpell, 1978). Various explanations have been put forward for why this policy was adopted right after the nation achieved political independence in 1964, even though UNESCO had recommended use of local languages in education since 1958 (UNESCO, 1958). The Minister of Education justified the decision as necessary for breaking down the racially segregated public school system imposed by the colonial administration (Mwanakatwe, 1968). Others, however, have argued that prioritizing English over the indigenous Bantu languages reflected a legacy of cultural hegemony infused into the reasoning of policymakers through religious proselytization by Christian missions that often conflated religious philosophy with European ideological myths of cultural superiority (Snelson, 1974; Serpell, 1993; Nkolola-Wakumelo, 2013). The task force charged with framing policy in the wake of a national debate on educational reform in the 1970s rejected a formal proposal by local language experts (Serpell, 1978) to reverse the policy and reintroduce initial literacy instruction in the Zambian languages, on the grounds that it would be economically impracticable and politically divisive in a multilingual society (Ministry of Education, 1977). More recent political and sociolinguistic analyses (Rassool 2013; Williams, 2013) have argued that forces of economic globalization and political class formation have converged to provide continuing legitimacy to the enduring prestige attached to English in Zambia, bolstering public resistance among parents to the use of indigenous languages in the school system.

Nevertheless, in 1996, a new policy was announced (implemented from 2000), introducing literacy in first grade in one of seven indigenous African languages, followed by a gradual transition to English in later primary grades (Tambulukan., 2001; Sampa, 2005). Of the seven indigenous languages, one particular language was prescribed as the medium of instruction in a given zone. This decision was based on the prevalence (familiarity and use) of the language by the community in that zone, compared to the other six indigenous Bantu languages (Kashoki, 1990;

Banda, 1998; Serpell, 2014). The new curriculum combined two major technical advantages for ease of initial learning: local language familiarity and orthographic transparency. For most children in a given zone, the language was the mother tongue, family language or common language of play. Moreover, all the indigenous Bantu languages of Zambia, and indeed of the South-East-Central African region, share an almost fully consistent pattern of one-to-one phoneme-grapheme correspondence (Banda, 2008; Banda et al., 2008).

Initial pilot projects in two rural districts comparing the new curriculum with the preexisting English-medium immersion scheme yielded very encouraging results, showing large and significant improvements in performance under the new curriculum. However, implementation of the policy nationwide has failed to maintain that finding (Sampa, 2005). Among the many explanations that have been proposed for this failure are the following:

- The inferior effectiveness of the new curriculum when implemented nationwide may reflect the inclusion of larger numbers of lower-general-ability learners.
- The greater variety of home language backgrounds represented (especially in urban schools), compared to the relatively homogeneous rural speech communities sampled by the pilot projects resulted in fewer classroom learners' being familiar with the particular zonal language used as the medium of instruction.
- The period of initial instruction in a local Bantu language may have been too short to allow for consolidation of learning, resulting in a decline of performance after English was introduced in Grade 2.
- Teacher training for national implementation may not have matched the level of that achieved in the pilot projects, resulting in less consistent and effective instruction.

Current efforts to improve early literacy learning outcomes in Zambian public schools, supported by the USAID-funded Read To Succeed programme, are guided by the last two of the above explanations. The period of instruction in a Bantu language has been extended to the first four years before the introduction of English, and in-service professional development courses have been designed with stronger emphasis on a phonics approach.

The most recently implemented Primary Literacy Programme (PLP) to promote early grade reading in seven official local languages was launched at the end of 2013 under the revised curriculum. It focuses more on phonics-based teaching methods as opposed to the previously common whole word ('look and say') approaches (Ministry of Education, Science, Vocational Training and Early Education, 2013). In the new literacy programme, official local languages are used for reading and writing from Grades 1 to 2 and the local languages are used as the medium of instruction until Grade 4. Oral English is introduced in Grade 2, written English in Grade 3; from Grade 5 onwards English is the medium of instruction in all the subjects. The programme provides two years of literacy instruction in the local language instead of just one year as in the previous programme. While the most recent programme of literacy instruction is more promising than earlier ones, the most recent assessment results achieved through the Early Grade Reading Assessment (EGRA) (Brombacher, et al. 2015; Sampa, Ojanen, Westerholm, Ketonen & Lyytinen, 2018) in Zambia reveal that the majority of children are still

failing to acquire basic reading skills in a local language before the end of Grade 2. Failure to learn to read in the local language during the first two years of primary school is a major risk for failure in upper grades taught in the English language.

While the new policy for literacy instruction is based on research into literacy, its effective implementation relies on the successful training of teachers and on sufficient reading materials in the local languages. Almost all of today's Zambian teachers themselves learned to read during the English medium era (pre-2000). They may therefore not be fluent readers of the respective local languages or may have poor phoneme awareness, which factors in turn will compromise implementation of the local language curriculum. In order to alter the English medium mindset formed pre-2000, it is important that teachers now also receive adequate and effective training in the correct use of phonics-based instruction methods and in how to support learners in building literacy skills, from letter-sound knowledge to reading fluency. Furthermore, many teachers (Yalukanda, in preparation), despite receiving orientation training on the new Primary Literacy Programme, still continue to use 'look and say' literacy instruction they recall from their own English language literacy instruction, instead of using the phonics-based approach more suited to local Zambian languages. One explanation for such low performance could be that teachers receive inadequate training in the local language phonics. Possibly the most influential problem is that teachers (because their own instruction focused on learning to read English at school age) use English letter names when instructing initial steps of reading of local language. The English letter names and the correct local language phonemes are pronounced in inconsistent ways, as is the case with vowel sounds such as /a/, /e/ and /i/ (Ojanen, Kujala, Richardson & Lyytinen, 2013). This practice naturally causes problems when teachers are teaching literacy in a local language (Yalukanda, in preparation). It can slow down learning of all children, as shown by the results of the recent Early Grade Reading Assessment (EGRA) (Sampa, Ojanen, Ketonen, Westerholm & Lyytinen, 2018), and can pose a special risk for children who have learning difficulties.

THE IMPACT OF ORTHOGRAPHY IN LEARNING TO READ

The challenge for education in many countries in sub-Saharan Africa is that the most common languages of instruction (for example, English, French) also happen to have some of the most difficult alphabetic orthographies in which to learn to read and write. These prove a considerable challenge even for native speakers (Seymour, Aro & Erskine, 2003), let alone for children who have been only minimally exposed to these languages before school entry.

In the study by Seymour et al. (2003) comparing literacy acquisition in 14 orthographies in Europe, Finnish children were the fastest learners because of the transparency of Finnish orthography. A Finnish child needs to learn only 23 connections between letters and sounds and to invent how to assemble the sounds into syllables and words. Almost half of Finnish children acquire basic reading skills before they enter first grade, and most acquire them during the first semester of Grade 1. After that, they are able to concentrate on the development of reading fluency and comprehension. In contrast, children who learn to read in the English language must master hundreds of connections between spoken and written items

before being able to read. A substantial number of English words cannot be pronounced without seeing the whole word; so the child needs to memorize certain letter sequences by heart. The complexity of English orthography thus makes English language problematic as a universal model for reading instruction (Share, 2008) and may be misleading for literacy instruction in other languages. It is especially problematic in terms of how initial reading instruction should be organized, with challenges already emerging from the stage of learning the sounds of single graphemes.

It would seem obvious that, from the learners' perspective, the language of instruction should be selected with a view to making the learning process as easy as possible, and that literacy instruction should take place in a familiar language with transparent orthography. However, even in countries where early literacy instruction is taught in a local language, children are often expected to transfer into the foreign language (for example, English or French) after four years. Four years is too soon. Children should not be required to transfer to second-language instruction before they are fully literate and academically fluent readers in their first language (Cummins, 1979). This level is often not reached before Grade 6 (Ball, 2011). After achieving basic decoding skills, not only are children able to use their reading skill for learning, but they also must be further motivated to read in order to develop reading fluency. Reading fluency in one's mother tongue lays a cognitive and linguistic foundation, not only for full literacy, but also for learning additional languages and other scholastic subjects (Abadzi, 2013; Ball, 2011).

Effective methods for teaching reading fluency in early grades are needed, because only sufficient reading speed makes comprehension of the written material possible. A requirement, in addition to appropriate instruction, is that appropriate learning material be available, material that sucks young learners into the world of written information. Appropriate material permits learners to make the automatization of the reading skill possible, which is necessary to prevent the emergence of new generations of illiterate adults, especially in countries where the school dropout rate is high (Abadzi, 2014). If schools lack learning materials and proficient speakers of local languages, then they cannot comply with language policy. Publishing of child-friendly texts in indigenous African languages has been severely constrained, by both market uncertainties linked to instability in public policy (Edwards & Ngwaru, 2010) and by costs associated with printing, making the material too expensive, which of course severely compromises any efforts to achieve literacy in the language concerned.

Educating teachers while they are still at college about the impact of language in literacy instruction could help to promote the use of local languages. The preference for English is also common in Tanzania (Ngorosho, 2011), where Kiswahili has been the medium of instruction for seven years. Kiswahili is widely spoken and has been used in literature; so its use in education should not be hindered by the lack of reading materials or possibility to speak it in the community. Teachers' choices of language are often affected by the opinions of the community around them. If parents are unaware of the impact of language in learning to read, they believe that education in a foreign language is preferable to the use of local languages. This widespread parental preference for English as the

language of instruction has been documented in Zambia (Chansa-Kabali, 2014), Tanzania (Ngorosho, 2011) and Kenya (Puhakka, Lyytinen & Richardson, 2015).

MOBILE LEARNING GAMES CAN IMPROVE LITERACY

In present day Africa, mobile phones offer an affordable and easy-to-use gateway to reading material, and access to the Internet gives a person more reading material than in any physical library ever built (West & Chew, 2014). The best thing about mobile phones is that most people have them: of the 7 billion people on earth, only 4.5 billion have a toilet, but over 6 billion have a mobile phone (United Nations, 2013). In some countries, such as Namibia, there are more mobile phones than people (The Namibian, 2012). Providing literacy materials over the Internet, accessed using mobile phones, is a transformational opportunity for improvement of literacy levels in Africa. It should be noted that technology alone is not, however, sufficient for sustainable development. The content of online learning environments needs to be evidence-based and developed to fit local environments.

Educational games can provide users with new opportunities to learn basic scholastic skills and access to new learning materials through which to acquire full literacy. GraphoGame (GG) was designed based on the findings from the Jyväskylä Longitudinal Dyslexia (JLD) study, which followed 200 children with familial dyslexia from birth to adulthood (for the latest review of results, see Lyytinen, Erskine, Hämäläinen, Torppa, & Ronimus, 2015). A key finding of the study was that the degree of early letter knowledge was the best predictor of later learning difficulties in reading. The most efficient way to support children with reading difficulties in transparent writing environments is to provide them with practice in letter-sound (not letter name) knowledge. The challenge picked up on by the developers of GraphoGame was that children with dyslexia need massive amounts of repetition before they can learn the connections between the spoken sounds (phonemes) and the written symbols (letters, graphemes). Using the JLD study as their basis, they set out to create a means of supporting children who are struggling to read (Lyytinen, Erskine, Kujala, Ojanen & Richardson, 2009)..

Use of the original game in the Finnish language has long been supported by the Ministry of Education and Culture in Finland for all the children in the country. Over 20 language adaptations exist at the moment, including English and Pinyin Chinese. GraphoGame (GG) adapts to the players' performance and allows each player to receive individualized learning content during the game. The game can be used on multiple platforms, including desktop computers and smartphones/tablets (Android, Apple, Linux and Windows). Data on the learning process for assessment, feedback/follow-up and research purposes are collected (Richardson & Lyytinen, 2014). Pedagogically, GG teaches children grapheme-phoneme connections (sounds, syllables, word formation) based on synthetic and analytic phonics instruction by constantly adapting to the particular player's skill level. The aim of such adaptability is to keep the training optimally challenging for the child concerned and to ensure that the child receives mostly positive feedback (around 80% of trials). The reports provided by children who play the game suggest that they enjoy playing GG. Moreover, many parents report that their children are highly motivated and concentrated when using GG (Ronimus, Kujala, Tolvanen & Lyytinen, 2014). Research with the German language adaptation of GraphoGame

in Switzerland also showed the expected changes in the brain networks of the players after a short intervention (Brem et al., 2010).

Because of the similarity between the orthography of the Finnish language and many local languages in Africa, GraphoGame could be well suited for use in providing additional support for learning basic reading skills. A study by Jere-Folotiya et al. (2014) documented how the greatest effects of playing GraphoGame were attained when both the Grade 1 teachers and their learners in the urban areas of Lusaka were exposed to the game. It was observed that teachers could use the game to improve their letter-sound knowledge in the local language, knowledge essential to imparting basic literacy skills to early grade learners. Furthermore, teachers reported that they made reference to the content and the order in which it was presented in the game to help create their lesson plans for literacy classes (Jere-Folotiya et al., 2014). The Reading Support in Zambia study (Folotiya et al., 2014) was a carefully controlled application of GG under several different conditions within a sizeable (N=587) randomized sample of learners in Lusaka government primary schools.

Implementation in that study and in the subsequent rural pilot (Ojanen et al., 2015) was guided by principles of ecological validity and cost-efficiency with a view to scaling up replication of successful interventions. GraphoGame was also tested in rural areas in Zambia in an intervention in which Grade 2 learners and their teachers and families were exposed to the game. Despite the many challenges experienced in rural areas, among them the lack of electricity and lack of previous exposure to various forms of ICT ('information and communications technologies'), the response to GraphoGame was promising (Ojanen et al, 2015).

Zambia is not the only country in sub-Saharan Africa in which the use of GraphoGame has been studied (Ojanen et al. 2015). [In Tanzania, a Kiswahili game version has been used by, for example, researchers at the Sebastian Kolowa Memorial University.](#) [In Kenya GraphoGame has been piloted in a multilingual environment in Kikuyu and Kiswahili languages \(Puhakka et al., 2015\) and used by the Kenya Institute of Special Education in research as an intervention tool for non-readers.](#) In Namibia, the University of Namibia was involved in a PhD research thesis (February, 2018) on the adaptation of GraphoGame for Afrikaans. In Namibia, learners with reading difficulties were allowed extended playing time with GraphoGame Afrikaans, with results showing a marked improvement in a number of aspects of reading.

The benefits of GG as a learning aid can be understood as catalytic, affording opportunities for teachers and parents to focus more clearly on the needs for instructional support among young initial literacy learners, and for researchers and administrators to monitor more closely the progress of students and their teachers.

CHILDREN WITH LEARNING DIFFICULTIES NEED ADDITIONAL SUPPORT

Closer examination, however, suggests African children's low success rate in terms of mastering basic literacy may have one particular root cause: the inadequacy of the initial literacy curriculum to address the learning needs of the broad spectrum of children in the more inclusive educational programmes introduced as part of the initiative Education for All (EFA, 2015). While children

of relatively high general cognitive ability are often able to learn to read with minimal instruction, for average and lower-ability learners, successful mastery of the basic grapheme-phoneme code may depend more heavily on a combination of several cognitive factors. Familiarity with the spoken language used as medium of instruction undoubtedly makes initial literacy learning easier, by allowing the learner to retrieve meaning from the text as soon as it is decoded. Moreover, the orthography of some languages is much less transparent than others, so that even first language speakers of English in the United Kingdom require significantly longer on average to master initial literacy than first language speakers of languages such as Finnish and Italian in their national public schools (Seymour, Aro & Erskine, 2003; Aro & Wimmer, 2003; Ziegler & Goswami, 2005).

Identifying children who need additional support requires some form of literacy skills assessment. At an individual level, games like GraphoGame can facilitate dynamic assessment. GraphoGame can also help to identify children whose readiness to learn, even under optimal instruction, is compromised. It can thus differentiate between them and children who fail because they have not received appropriate instruction. GraphoGame and the dynamic assessment that it enables is soon to become available in Zambia thanks to the PhD research of Jonathan Munachaka (in preparation).

In many countries, large-scale school performance assessments are conducted regularly. A global national assessment to the effect that children are not learning anything can be demoralizing. Serpell and Simatende (2016) hope that such assessments should aim to reveal not only weaknesses and needs, but also strengths and opportunities for improvement. Therefore caution is needed when interpreting reports on very low reading outcomes. Large-scale surveys of national performance can, in principle, serve to motivate policymakers and teachers to enhance the quality of basic schooling (Serpell & Simatende, 2016). Literacy assessments should be designed to ensure that cultural and linguistic environments are taken into careful consideration. After all, their aim must be to support children's education.

Understanding the impact that orthography has on learning to read is key to supporting the children who have learning difficulties. In European countries like Finland, as many as 15% of children need additional support for their learning in order to keep up with the grade-level expectations. In Europe, learning difficulties are linked to reading difficulty or dyslexia, which can have a genetic origin (e.g., Lyytinen et al., 2015). In Africa, the prevalence of children who have inherited learning difficulties is currently unknown in most countries, and support services are not available. The number of children who are struggling to learn to read for environmental reasons (language, poor instruction methods, lack of reading materials) is so large that little attention has been given to children who have specific learning difficulties. For example, in Zambia, for half a century now, many attempts to improve the reading situation have been made (MoE, 1996, 2013), but none has been holistically targeting children with a reading disability. Children with dyslexia tend to be under-identified and hence rarely receive help in learning to read, a situation that may compromise the progress of many Zambian children from the early grades of school. Many children in Zambian schools could be invisible dyslexics (Hettleman, 2003). These are children whose education is at

risk if their problems in learning to read are diagnosed too late and treated too little, or not diagnosed or treated at all.

EDUCATION POLICY NEEDS TO BE BASED ON RESEARCH

The Education for All Global Monitoring Report for 2015 (EFA, 2015) states that language is of considerable importance for the quality of teaching and learning. It also states that the lack of textbooks and the shortage of trained teachers using the languages are among the biggest obstacles to using local languages in the classroom (EFA, 2015). In many schools, the short school hours and high teacher-student ratios severely compromise teachers' abilities to give enough attention to struggling readers. Mobile technology could be one way to provide additional support. The use of mobile technology, particularly in low-income countries, has the greatest potential for ICT-based learning and allows large numbers of trainees (EFA, 2014) to be reached. Mobile platforms could also be used to disseminate much needed reading materials in local languages. One example of such use are the children's books created for a Zambian writing competition by the Centre for the Promotion of Literacy in sub-Saharan Africa (CAPOLSA) (Serpell, 2014b).

It should be acknowledged that, because of the effect orthography has in reading acquisition, policy on language of instruction has much wider implications than has previously been acknowledged. Children can learn early literacy skills relatively quickly and easily if instruction is in their mother tongue, or if the orthography in question is consistent with their mother tongue or a familiar language. In a world facing a multitude of challenges, it may feel overwhelming to learn about yet another problem area in education. However, incorporating the latest findings on the impact of language on literacy into policy could be of great benefit. After all, creating literacy teaching programmes and teacher training models that encourage teachers to provide early literacy instruction using language-appropriate methods could improve the quality of education for a vast number of children. Using local African languages and training teachers to use phonics-based reading instruction methods could improve literacy rates across the continent and decrease the risk of children's dropping out of school.

However, further research is needed in this respect. The challenges of rural and urban school settings and of different indigenous Bantu languages must be compared, as must other challenges of imparting literacy: to bilingual children; within multilingual speech communities; using urban dialects; using syllabic rather than phonemic entry points to instruction in grapheme-phoneme correspondence rules. Research must also be conducted into the various ways of supporting the transition from initial literacy in a Bantu language to literacy in English; into alternative modes of technology dissemination; into refined methods of assessment. Mobile technology could provide additional support for reading instruction, but it is important to note that technology can be beneficial only if the learning materials are research-based and appropriate for the language and cultural environment. This context should motivate users of technology not only to train in basic reading skills, but also to immediately start using them to change their current situation (where most people have little access to material they can read for enjoyment). There is a great need for more child-friendly literature. The risks of

not reaching fluency during the first four years of school are considerable. If reading fluency is not reached and children drop out of school, they might lose the literacy skills they acquired at school. Easily accessible children's literature in local languages is needed to support literacy learning. Combining best practices of literacy teaching and mobile technology can support development towards inclusive societies.

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