Designing for Complexity in Mother Tongue or First Language (L1)-Based Multilingual Education Programs

Corrie Blankenbeckler
Creative Associates International

Abstract

Mother-tongue or first language (L1)-based multilingual education programs are necessarily complex and may require a more nonlinear approach to program design. These programs operate within and act upon a range of psycholinguistic, sociolinguistic, and sociopolitical issues that include language structure and literacy assessment, language policy and politics, and cultural and social behavior change linked to literacy expansion. The broad use of one-size-fits-all outcomes-based design approaches for L1-based multilingual education programs often result in designs that are retrofitted to new country settings and ill-suited to the context in which they are implemented. This paper looks at some of the many features that can be used to inform the development of L1-based multilingual education in the context of early literacy programming. Specifically, it examines the use of alternative approaches in the development of flexible theory of change design that integrate early literacy and L1-based multilingual education program design frameworks to more suitably address the sociolinguistic, sociopolitical, and psycholinguistic assumptions underpinning multilingual education approaches.

Keywords

Mother-tongue; Multilingual education; Complexity; Nonlinear design; Early literacy; Theory of change; Sociolinguistics; Psycholinguistics; Language policy and planning

Introduction

Life is not simple, but many of the logic models used in programme theory evaluation are. Is it a problem to represent reality as a simple causal model of boxes and arrows, or should the logic models we use address the complexity of life—and if so, how?
(Rogers, 2008, p. 29)

Program theory of change is intended to guide purposeful program planning and evaluation. Variously described as theory of change, theory-based evaluation, logic model, and many other variations, program theories outline causal linkages between different aspects of the program (inputs, activities, outputs and outcomes) used to evaluate program effectiveness or impact (Rogers, 2008; Weiss, 1998). A theory of change is commonly used as a heuristic device, an abstract framework, or a model that informs thinking and predictions about social change. The models used in the development of theories of change can vary

significantly depending on the funding mechanisms and context. Glouberman and Zimmerman (2002) draw distinctions between simple, complicated, and complex program theories that are helpful in determining interventions that may require evolving design as effects or outcomes emerge through the course of implementation. To use their examples, a simple theory can be compared to a recipe, easy to replicate, provided you have the right tools and ingredients. Sending a rocket to the moon is far more complicated to design and difficult to evaluate given the number of variables involved. Raising a child brings in levels of complexity that preempt common agreement on a predetermined design for success. In an analysis of how to address the complicated and the complex in program design, Rogers (2008) underscores the need for models that reflect the organic complexity that underpins human interaction. Programs

designed to address social behavior change can tend to oversimplify with a single linear design that ignore related parallel causes, or may require more iterative, nonlinear approaches that open opportunity for unexpected learning and adaptability. The language contexts in which mother tongue or first language (L1)-based multilingual education programs operate arguably fall into more complicated or complex categories demanding nonlinear approaches to program theory design.

This paper examines the complexities of the language environments in which L1-based multilingual education programs operate that are often overlooked in programs that focus on early literacy, with out-of-the-box outcomes-based design focused on quick wins, most often manifest in measurable improvements in reading subtask scores (i.e., letter recognition) in target schools (Bartlett et al., 2015; Benson, 2004). The restricted focus of early literacy intervention programs on mother-tongue outcomes in the early grades, while showing some improvements in the short term, can discount larger psycholinguistic, sociopolitical, and sociolinguistic issues that are present in multilingual environments. A limited focus can lead to an overall, longer term negative impact on student learning, especially in contexts where there is an early transition from the first language to the second or national language (Alidou et al., 2006; Baker, 2011; Hornberger, 2002).

L1-Based Multilingual Early Literacy

The benefits of learning in a familiar language have long been recognized (UNESCO, 1953), and there is a large body of evidence from diverse contexts that has demonstrated the positive effects of learning in the mother tongue in diverse contexts (e.g., Alidou & Brock-Utne, 2011, [Niger]; Benson, 2004b, [Mozambique]; Hovens, 2002, [West Africa]; Piper et al., 2016a,

[Kenya]; Skutnabb-Kangas & Heugh, 2012, [Ethiopia]). The opportunity to learn in the mother tongue or first language (L1) is recognized as a right (United Nations, 2008) and a benefit (UNESCO, 2003), though the matter is not without continued dialogue and debate (May, 2005; Skutnabb-Kangas & Heugh, 2012; Wiley, 2012). Although many language policies around the world have been amended to accommodate the linguistic diversity that is reflective of a language environment, over half of the world's children continue to be taught in a language that is different from what they speak at home (Ouane & Glantz, 2010).

Hornberger (2009) observes that multilingualism, not monolingualism, has been the natural state of human societies throughout history and that the imposition of a single language serves as a cultural limitation. It is true that despite the demand for, and increasing dominance of, English and other global languages (Clayton, 2008; Hornberger, 2009; Ricento, 2000), linguistic diversity remains a defining characteristic of the global context. Although language statistics often obscure the complexity of linguistic heritage or language type and use, the numbers are still staggering (Skutnabb-Kangas & Heugh, 2012, p. 12). There are between 1,500 and 2,000 African languages, over 80 estimated in Ghana alone (Mann & Dalby, 2017). India has 447 living languages, 64 of which are institutional (Eberhard et al., 2019). In the United Kingdom, an estimated one in six children speak a language other than English at home (Tinsley, 2013). Given these facts, it should not be surprising that an estimated 40% of the world's people lack access to education in a language they can speak and understand (UNESCO, 2016). Of the 6,000 -7,000 languages spoken around the world, only a few hundred are used in education (Walter & Benson, 2012).

There is general consensus that the use of the mother tongue as medium of instruction for

foundational literacy has a tremendously positive impact on education quality and academic growth of individual learners, especially in low-income contexts (Alidou et al., 2006; Benson, 2004a; Cummins, 2000; Skutnabb-Kangas, 2000). While monolingual education is still standard practice around the world (Benson, 2014), a number of early grade literacy programs now focus on the acquisition of reading skills in the mother tongue prior to transitioning to a second language, usually a national language (e.g., Amharic in Ethiopia) or global language (e.g., English, French, or Portuguese). Definitions of "mother tongue" in these programs can vary depending on context. According to Skutnabb-Kangas (2000), the mother tongue can refer to a language that a child may have learned first or knows best, but can also be the language the child most identifies with (or is identified with by others) or uses the most. In education, the L1 is generally defined as the language that a child understands and speaks well enough to be able to learn successfully at grade-level (Benson & Kosonen, 2012). In this case, the L1 is not always the language that the child speaks at home, learned first, or knows best. In many contexts, the selected language of instruction (referred to as the L1), may be a language from the community that is well-understood by the child, but is not in fact the child's mother tongue. In this paper, I use the definition provided by UNESCO (2003): L1 as primary or first language. L2 will be used to describe a second language introduced in education, and Lx may be used to describe multilingual contexts where a third or additional language is used.

L1-based MLE describes programs that prioritize learning in the L1 in a multilingual environment (Bender et al., 2005; UNESCO, 2003). In some contexts, the L1 is introduced as the language of instruction in the early grades to facilitate learning the fundamentals of literacy

and numeracy. In other cases, the language of instruction is the national or official language (L2) and the mother tongue is used by the teacher only to ease learning in the L2. In multilingual contexts where there are local languages spoken that differ from the national language, it is rare that the L1 is used as language of instruction beyond primary school, and it is very often the case that it is used only in the early grades—grades one, two, and sometimes three (Alidou et al., 2006).

The arguments for the use of L1 in early grades is tied to strong evidence showing that the L1 facilitates the acquisition of reading skills in both the L1 and L2 (Bialystok, 2011; Collier & Thomas, 2004; Cummins, 1984;). Cummins' (1984) linguistic interdependence hypothesis explains a process of transfer of L1 language and literacy knowledge into the L2, whereby L2 proficiency is heavily dependent on the capabilities children have already developed in the L1. Learning to read first in an L1 does not put young children at a disadvantage; in fact, the learning transfer occurs both ways between L1 and L2. The transfer should not be rushed and must pay proper attention to oral language development in both languages. Foundational literacy skills in the early grades of primary school must be maintained and developed throughout early primary education in order to succeed in school (Benson, 2004b; Stanovich, 1986).

The task of learning to read (in any language) is not easy or straightforward, requiring a complex set of processes working together (visual, linguistic, cognitive) in order for the brain to make sense of the markings that form letters and words (Dehaene, 2009; Wolf, 2008). Education systems struggle to provide learners with the tools they need to acquire these skills, and many learners quickly fall behind, especially in low-resource contexts, where learner-appropriate printed resources are a

scarce commodity. The negative effects of delayed reading skills compound later academic challenges, often leading to high dropout rates, particularly among poor and disadvantaged groups (Stanovich, 1986). In a call to arms that laid some of the groundwork for the Sustainable Development Goals, UNESCO (2014) declared a "global learning crisis": 250 million children are not learning to read and write, including the half that have attended early primary grades. Progress is slow, and nearly 50% of children and youth are still not achieving minimum proficiency levels in reading and mathematics (UNESCO, 2019).

There are two major challenges that have emerged over the past few decades: 1) an unstated reliance on monolingual, English language-based early literacy development and assessment research to guide international program design, and 2) heavy emphasis on development of a subset of foundational literacy skills (e.g., phonological awareness and phonics), often at the expense of critical focus on more wholistic development of a child's receptive and communicative language development in both the L1 and L2. Many early grade reading programs introduced in international contexts over the last two decades are guided by the principles drawn from the findings of the National Reading Panel (2000), which sets out five core component skills of reading: phonemic awareness, phonics, vocabulary knowledge, oral reading fluency, and comprehension. While building on one another, each of these skills require a discrete set of approaches to teach effectively, requiring explicit instructional practices (Archer & Hughes, 2011). In Hoover and Gough's (1990) "simple view of reading," the complex process of learning to read is distilled into two categories: decoding and linguistic comprehension. Each category carries with it a complex set of processes needed to acquire literacy. This

practical definition has been broadly used to inform program development and pedagogical approaches.

The reductionistic way in which these approaches are applied in diverse contexts have been criticized (Hoffman, 2009). In international program practice, the simple view is at times erroneously used to denote a relationship between fluency (defined and measured as automaticity) and reading comprehension, rather than decoding and linguistic comprehension for reading comprehension. Scholars have attributed such confusion to the widespread use of the Early Grade Reading Assessment (EGRA) developed by the Research Triangle Institute in 2005 (Benson, 2013; Dowd & Bartlett, 2019; Graham & van Ginkle, 2014). The EGRA is based on an adapted version of Dynamic Indicators of Basic Early Literacy Skills (DIBELS) designed for English literacy learners in the United States. EGRA was initially developed as a diagnostic instrument that has been used to shine a spotlight on the extent of poor reading skills in low-income contexts (Benson &Wong, 2015; Dubeck & Gove, 2015; Gove & Cvelich, 2011). As a diagnostic tool, the results are used to inform curricula and training reform efforts, and define L1-based MLE intervention design (Pflepsen, 2015). Beyond diagnostics, there is now widespread reliance on the EGRA as a framework by which to structure and measure progress in early grade literacy program implementation in a wide range of multilingual contexts, which has its limitations.

Substantial floor effects on the fluency benchmark in EGRA results have led to interventions that target what Bartlett, Dowd, and Jonason (2015) categorize as emergent and decoding skills, stressing "phonics and phonemic awareness more than comprehension" (p. 309). Scholars have also pointed out that the EGRA assessment does not assess prosody, and

fluency rates (correct words per minute) have been used as a proxy for reading comprehension, an assumption that has its limitations when comparing fluency across languages with variable word length and grapheme complexity (Dowd & Bartlett, 2019). Graham and van Ginkle (2014) provide a thorough critique of these limitations in non-English language contexts, noting that the use of correct words per minute as a benchmark fails to account for the "range of differences between languages and orthographies that may influence reading acquisition" (p. 245). Length of the words (agglutination), syllable structure, linguistic transparency, and tone all play a role in the time needed to read and understand a passage, and it is difficult to compare different languages against a common, timed standard.

Attention to the structure of the languages plays an important role in biliteracy development. Linguistic distance and writing systems can present substantial challenges for L1 to L2 transfer (Koda, 2007; Perfetti & Dunlap, 2008; Tan et al., 2003). Researchers have examined the cross-linguistic differences in phonological awareness and receptive vocabulary as predictors of word and letter reading tasks and found that the range of difference is dependent as much on the structure of the language as on relative status of the language—L1 or L2 as medium of instruction (Jasińska et al., 2019; Ziegler & Goswami, 2006). Studies have also shown that students need to develop a sufficient oral language threshold in the L1 in order to transfer the reading skills to the L2 (Hovens, 2002; Koda & Zehler, 2008; Piper et al., 2016a). Recent research on the transfer of L1 to L2 literacy skills in India has demonstrated that a higher threshold is needed for L2 oral language development in order to optimize the transfer of L1 literacy skills for reading in the L2 (Nakamura et al., 2018).

These studies are contributing to a broader base of evidence that demands a more nuanced psycholinguistic and context-driven approach to address literacy acquisition in multilingual contexts that have not yet been adequately addressed by the EGRA and other global standards. Despite the growing body of research, study of biliteracy and multi-literacy development is still very much in the nascent stages. Successful biliteracy or multiliteracy development varies by context, language, and policy, but is also dependent on language-specific pedagogical approaches to literacy acquisition. More research is needed to provide language- and context-specific definition of the threshold and independence hypotheses that undergird cross-linguistic transfer and biliteracy acquisition among non-dominant languages and marginalized populations. Greater consideration for language policy and planning will be needed to address and sustain mother tongue-based programs that are able to deliver biliteracy and multiliteracy outcomes for successful learning beyond the early grades.

Language Policy and Planning

The politics of language deeply influence the success of multilingual education initiatives. Languages develop from and are situated within specific communities and cultures, and can be understood as the code to understanding a particular culture or society (Wardhaugh, 2011). Language acts or policies have a profound impact on the social construct of the affected communities and cultures. In the African context, Ouane and Glantz (2010) have associated the investment in African languages and multilingual education with the "deep social transformation induced by a political, cultural and development project and an education reform agenda" (p. 48). Language policies are often influenced by local language rights, linguistic development of the relevant languages,

or other ideological factors. The relationship of language to identity and culture also carries with it the power to marginalize and oppress communities, which has been done time and again throughout the history of human development (Skutnabb-Kangas, 2000). Educational initiatives that aim toward multilingualism have the potential to empower those who have been oppressed through language policies, and they also hold the potential to activate local voices, but failure to address language policy and planning can result in an experimental approach that does not have lasting impact, or may have unintended negative consequences. Unfortunately, many programs fail to address the policy and planning required for meaningful and sustained implementation of new languages into the school system (Ansah, 2014; Hornberger, 2006a, 2009; Trudell & Piper, 2013).

Language Policy and Planning (LPP) has been variously employed over time by scholars and practitioners to describe and inform behavior change with regard to language management (Ricento, 2000; Ruiz, 1984; Tollefson, 2002). LPP is commonly formulated around three overlapping and interdependent areas: status planning, corpus planning, and acquisition planning. Each of these has taken on various forms and approaches depending on the context and use (Hornberger, 2002). Status planning, also described as the function of language in society, deals with the politics of linguistic imperialism, language revitalization, language use in official domain, and issues of language selection and choice (Clayton, 2008; Hornberger, 2006b; Skutnabb-Kangas, 2000). In corpus planning, efforts are generally directed toward specific areas of linguistic structure and variants, including standardization, graphization, choice of script, and orthographic conventions (see for example the discussion of orthographic standards among Bantu languages

in Canhanga & Banda, 2017), purification (removal of borrowings, rise of language academies), and terminology development (new term, old term with new meaning, borrowed term, calque). Acquisition planning is concerned with language distribution and use, such as medium of instruction in education (Tollefson, 2008). L1-based MLE programs commonly fall under acquisition planning, seeing language as a resource for learning (see the discussion on orientation in language planning in Ruiz, 1984).

L1-based MLE programs will inevitably interact—by design or accident—with status and corpus planning, especially when non-dominant languages are introduced as the medium of instruction. The official status of a language—language policy—does not automatically translate into a language of instruction (LOI) policy. In Morocco, Berber (Tamazigt) was regarded as a minority local language until its official recognition in 2011 (Maddy-Weitzman, 2011). However, despite efforts to introduce the Berber language into the public-school system, the languages of instruction are still Standard Arabic and French, while Berber is taught as a subject only in a certain select number of schools (Johnson, 2013). In other cases, minority languages are not officially recognized, which leaves many children without access to education in their mother tongue. There are between 50 and 80 indigenous languages spoken in Ghana, although only eleven are recognized by the government, and English remains the official language of state institutions (Ansah, 2014; Eberhard et al., 2019). For sustainability and quality of programming, L1-based MLE programs must enter into policy level discussions in order to advocate for the models of education, all of which will depend on the theoretical or ideological orientations to which the program ascribes.

Language of instruction policies also vary in purpose and scope, and rarely do these policies

address issues of language-specific approaches to literacy instruction. Baker (2011) presents a comprehensive typology of the multilingual education models from fully L1 monolingual (submersion or segregationist), to weak transitional L1 to L2 models (usually early exit), to strong additive (immersion, maintenance two-way, dual medium, and mainstream) Additive approaches are considered most effective, integrating local languages alongside the L2 for as long as possible, even through secondary education (Alidou et al, 2006; Benson & Kosonen, 2012). By contrast, the more common early exit model assumes that students will achieve mastery of the L2 at a very young age (primary grade 4), even though they may have little experience of the language outside of the school context (Alidou, et al., 2006; Cummins, 1979). In addition to the above challenges, many curricula attempt to teach students to read and write in both the L1 and L2 simultaneously, as is the policy in Bangladesh (Hamid & Erling, 2016).

Whatever the model, the many other practical issues of implementation of L1-based MLE programs will also interact with other LPP domains. Teacher selection and retention (e.g., mobility issues) will raise questions of the viability of L1-based MLE programs in the short- and long-term (e.g., teacher language capacity and willingness to teach in the local language, language policy change and geographic shifts of language of instruction policies; Heugh, 2008). Curriculum and textbook development can very quickly become entangled in orthographic and linguistic variant debates when indigenous languages are newly standardized, or still in the process of standardization, with little experience or widespread use of the new standardized versions (Alidou et al., 2006). Inappropriate or top-down language selection and language mismatch (spoken language different from medium of instruction) can compromise or

weaken a program before it has even begun (Piper, Zuilkowski & Ong'ele, 2016). In short, L1-based MLE programs can inadvertently problematize languages through exclusion (through ignorance or by design), or by failing to address some of these policy issues early on.

L1-based MLE Programming in Context

L1-based MLE programs have expanded rapidly over the past two decades. As of 2016, with substantial support from the United States Agency for International Development (USAID), as well as the World Bank and others, the EGRA has been implemented in 72 countries and an estimated 129 languages (Dowd & Barlett, 2019). The emphasis of these programs has been L1-based early grade literacy instruction. Programs have highlighted the paramount importance of the use of the mother tongue in early literacy acquisition and have seen some success in moving from pilot to policy-driven scalable models (Gove & Wetterberg, 2011). The USAID 2011 Education Strategy made a strong case for L1 learning and the need for USAID programming designed in accordance with "appropriate language policies," and "where these policies do not exist, USAID should engage in policy dialogue with host country government and partners in an attempt to improve policy, as on other technical issues" (USAID, 2012, p. 4). In 2015, the USAID-funded Global Reading Network published a document designed in "practical response to requests from USAID's Africa Missions," to assist in program design for L1-based MLE (Pflepsen, 2015, p. 1). The publication highlights many of the above-mentioned LPP considerations and provides an important list of concrete steps that might be followed in the implementation of USAID-funded L1-based MLE programs, including transfer of skill across languages, language context and mapping, orthography development

and standardization, teachers' language proficiency, and so on (for the full list, see pp. 42-43). The USAID 2018 Basic Education Strategy continues support for L1-based MLE but does not reference the report, nor does it provide explicit guidance on how to approach L1-based MLE program design.

Scholars have used an ecology perspective as a way to understand and analyze the ideologies undergirding language policy and practice (Hornberger, 2002, 2006b) and the interaction between languages "inside and across polities" (Creese et al., 2008). Hornberger (2006b) defines three themes in the ecology of language. First, languages live and die in relation to other languages. Second, languages are situated within a specific context—the language environment— that encompasses all range of human issues such as politics, economics, and culture. Third, languages are not static; they take breath in human hosts, and thus evolve and change, and can be endangered. The use of this schema "recognizes that planning for any one language in a particular context necessarily entails planning for all languages impinging on that one" (Hornberger, 2006b, p. 280). Conversely, programs that focus only on the use of the L1 fail to address planning for all languages.

A general review of recent USAID early grade reading solicitations in recent years shows heavy emphasis on L1-based reading instruction that is not always made explicit in the theory of change or results framework, and does not provide sufficient consideration of the multilingual context. The following patterns emerge from review of a few illustrative program designs since 2015 in Egypt, Ethiopia, Cambodia, Ghana, Morocco, Mozambique, Philippines, and Zambia (United States Government, n.d.). The objective or goal of the program is typically to improve early grade reading (sometimes grade specific, e.g., Cambodia; and once with the addition of numeracy, e.g., Ghana). Improvements in early grade reading may be accompanied by a qualifier such as proficiency or achievement, but without reference to medium of instruction (e.g., in Mozambique, the desired improvement is to read fluently and with comprehension). The intermediate results of the program focus on materials and instruction (combined or separate), systems strengthening and capacity building (combined or separate), and community engagement and support for education. Sometimes a unique fourth or fifth result is included in the program design (e.g., access in Zambia, assessment in Morocco, professional development of teachers and government accountability and transparency in Ghana, and vulnerable students and communities in Ethiopia). The EGRA is the expected measure for learning outcomes in all cases, except in the Philippines (no assessment mentioned), and in Ethiopia (where there are explicit instructions not to conduct an EGRA assessment). None of these design frameworks include explicit reference either to L1-based instruction or to biliteracy or multilingual education outcomes.

The above results frameworks would fall under Chen and Rossi's (1989) definition of "a sparse simple theory," that is distinguished from a "rich theory" (p. 301). To illustrate, a simple theory for early grade reading might be that *learner appropriate curriculum and instruction will improve reading*. A rich L1-based MLE theory, by comparison, might be proposed as follows: *learner appropriate curriculum instruction, when developed with stakeholder input for biliteracy in the L1 and L2, will enable learners to read to learn throughout the remainder of their learning experience*. A more in-depth read of the full solicitations reveals many implicit assumptions about program implementation that may result in emergent or unintended outcomes (e.g., policy environment

that does not favor local language instruction). In the following pages, I provide a closer look at the implementation of an early grade reading program in Mozambique to highlight some of the many dips and turns a program may take that may deviate from the program design, and challenge meaningful evaluation of program effectiveness and impact.

The USAID-funded Vamos Ler! (Let's Read!) program, a five-year program (2016-2021) implemented by Creative Associates International and partners, is designed to address poor reading outcomes by introducing a L1-based approach in support of the planned national expansion of bilingual education (Potter & Blankenbeckler, 2018). The strategic use of bilingual education as part of an effort to promote greater inclusion in Mozambique has a long history but has always been implemented on a small scale. First developed in 1993, it has gradually expanded from a small handful of schools to over 500 schools in 2015, still only a small percentage of the total number of over 15,000 primary schools (Benson, 2000, 2004; Capra, 2013). The bilingual education model is transitional, using local languages for instruction in literacy and numeracy in Grades 1-3, with Portuguese as a subject until full transition in Grade 4 (Minsterio da Educação e Desenvolvimento Humano [MINEDH], 2003).

The design of Vamos Ler! was initially aimed to improve reading and writing in the target languages of Emakhuwa and Elomwe in Grades 1 and 2 in nearly 3,500 schools in the northern provinces of Nampula and Zambezia. In early joint donor-partner meetings with ministry representatives, it was observed that the program did not fully represent the government's bilingual transitional approach, as it only focused on the selected L1 languages and did not include L2 (Portuguese) or L1 numeracy instruction in the proposed design. Other questions were raised about the language

selection and community reception of the program. There were several languages represented in Zambezia not included in the program, including one with a relatively large population of speakers—Echuwabo. One of the perceived challenges in implementing bilingual education at large scale at the time was the fact that the introduction of bilingual programming in individual schools is premised on community choice (Blankenbeckler, 2017). Bilingual education was indeed planned for gradual expansion, but the 2002 curriculum reform policy allowed for communities to choose between monolingual, semi-bilingual, or bilingual modes in the early grades (MINEDH, 2003). The intention to implement and measure at such a large scale would be difficult if not accepted and chosen by communities.

These initial conversations informed the design of three situational analyses intended to better understand the program's sociolinguistic context. A language mapping study was conducted to measure children's oral language proficiency (OLP) in each language they reported knowing. OLP was measured using a semantic fluency measure from a representative sample of 4,177 Grades 1-3 students in 212 schools in Nampula and Zambezia. The information gathered assisted policymakers and education specialists to identify the following: a) whether children's language proficiency matched the official language of instruction assigned to schools (the study found large mismatch between self-reports and semantic fluency tests, with only about 8% of students considered bilingual, and the majority of students [73%] L1 not matching the school's language of instruction); b) multilingual classrooms (approximately 62% of schools were linguistically heterogeneous—students with more than one L1); and c) the best choice of language for initial literacy instruction (mapping results revealed strong correspondence between

findings and census research, showing Echuwabo to have prevalence in southern regions, where previously Elomwe may have been used as the selected L1; Nakamura et al., 2018). This study was complemented by qualitative research and two additional studies that looked at the knowledge, attitudes, and practices of community members, teachers, and other education stakeholders with regard to bilingual education in Mozambique (Hua et al., 2017; Shulman, 2017). Findings from the latter assessments showed that parents' and communities' support for L1-based MLE could be vastly improved through more equitable provision of materials for local language instruction and teacher selection and training to improve teacher capacity to teach in the L1 and the L2.

These studies helped to inform a shift in design in many aspects of the program implementation, including the addition of Echuwabo as a language of instruction in select schools, and the addition of Portuguese as an area of intervention to improve oral language development and support transition from the L1 to L2 in Grade 4. All four languages (Emakhuwa, Elomwe, Echuwabo, and Portuguese) were included in an EGRA assessment for evaluation of literacy outcomes under the parameters of the program contract (Turney et al., 2017). Several social behavior communications campaigns were implemented to raise awareness among districts, schools, and communities of key L1-based MLE concepts. The program worked with provincial and district authorities to make bilingual education mandatory in select schools. The program additionally helped fund and promote a series of national events and workshops on bilingual education, and in 2019, supported the development of a scope and sequence for the remaining 14 national languages in addition to Emakhuwa, Elomwe, and Echuwabo (Kaplan-Nunes et al., 2019). These latter efforts may

correspond to what Rogers (2008) refers to as "'tipping points,' where a small additional effort can have a disproportionately large effect" (p. 38). A revised national bilingual education policy was released in August 2019 that reflected many of the program's recommendations and intervention evidence (MINEDH, 2019).

The Mozambique case illustrates just a few of the many sociolinguistic complexities faced in the implementation of L1-based MLE programs, including how the program adapted to the contextual realities in order to meet program goals. Many other psycholinguistic and sociopolitical aspects merit investigation that have not yet been explored. Weiss (1997) underscores that a program theory (and often multiple theories) are "rarely explicit and do not have to be right" and among other challenges to theory of change design, there may be more than one possible theoretical framework appropriate to the program goal (p. 503). As hypotheses, theories may be drawn from evidence in another context or another set of circumstances, but also may be based on assumptions, beliefs, or even intuition. However, program theory should be developed taking into account the level of complexity, the context, purpose, and evaluation needs particular to each program. If improved learning outcomes is the desired change, there may be more than one path to achieve this goal, or the path may need to take a few alternative or parallel routes. Learning in the L1 is a core element of academic success. However, this success will be limited, if, among other things, policy does not support or is not valued by communities, or the L1 is quickly transitioned to the L2, without adequate provision for L2 learning.

Conclusion: Designing for Complexity
"Bilingual education is a simplistic label for a complex phenomenon" (Baker, 2011, p 207).

It is not easy or straightforward to design a strong theory of change. The need for comparison drives many program theories of change, which can result in one-size-fits-all program design. To avoid this trap, flexible approaches can better allow for critical changes at the outset of the program—and along the way—to reflect new learning as the program progresses. Simple theories often seek to follow a linear path of cause and effect, whereas the on-the-ground realities merit a more complex design where more than one causal strand may benefit separate evaluations (e.g., policies may be required for delivery and implementation of new reading and writing approaches; Rogers, 2008). These programs might also benefit from a design for complexity that depends on activating a "virtuous circle" where an initial success creates the conditions for further success (Rogers, 2008, p. 38). The flexible approach to implementation in Mozambique allowed for critical, small changes that represent one of the factors that contributed to a "tipping point" in the policy expansion of bilingual education (Rogers, 2008). More guidance and research is needed to develop flexible, nonlinear designs for L-based multilingual programs that better reflect the complexity of the psycholinguistic, sociolinguistic, and sociopolitical contexts, and can allow for more collaborative, sustainable program implementation.

Acknowledgement

References

Alidou, H., Boly, A., Brock-Utne, B., & Satina, Y. (2006). *Optimizing learning and education in Africa – the language factor*. Paris, France: Association for the Development of Education in Africa.

Ansah, G. N. (2014). Re-examining the fluctuations in language in-education policies in postindependence Ghana. *Multilingual Education*, 4(1), 1-15.

Archer, A. L., & Hughes, C. A. (2011). *Explicit instruction: Effective and efficient teaching*. New York, NY: Guilford Press.

Baker, C. (2011). *Foundations of bilingual education and bilingualism* (Vol. 79). New York, NY: Multilingual matters.

Bartlett, L., Dowd, A. J., & Jonason, C. (2015). Problematizing early grade reading: Should the post-2015 agenda treasure what is measured? *International Journal of Educational Development*, 40, 308-314.

Bender, P., Dutcher, N., Klaus, D., Shore, J., & Tesar, C. (2005). *In their own language: Education for all. Education Notes*. Washington, DC: World Bank.

Benson, C. J. (2000). The primary bilingual education experiment in Mozambique, 1993 to 1997. *International Journal of Bilingual Education and Bilingualism*, 3(3), 149-166.

Benson, C. (2004a) Bilingual schooling in Mozambique and Bolivia: From experimentation to implementation. *Language Policy* 3, 47-66.

Benson, C. (2004b). The importance of mother tongue-based schooling for educational quality. Paper commissioned for the *EFA Global Monitoring Report 2005, The Quality Imperative*. Paris, France: UNESCO. Retrieved from http://unesdoc.unesco.org/images/0014/001466/146632e.pdf

Benson, C., & Kosonen, K. (2012). A critical comparison of language-in-education policy and practice in four Southeast Asian countries and Ethiopia. In T. Skutnabb-Kangas, T., & K. Heugh, (Eds.). *Multilingual education and sustainable diversity work: From periphery to center* (pp 111-137). New York, NY: Routledge.

Benson, C. (2013). L1-based multilingual education and EGRA: Where do they meet? *PRAESA Occasional Papers No. 40*.

Benson, C. (2014). Adopting a multilingual habitus: What north and south can learn from each other about the essential role of non-dominant languages in education. In D. Gorter et al. (Eds.). *Minority languages and multilingual education* (pp. 11-28). Berlin, Germany: Springer.

Benson, C. & Wong, K. M. (2015). Development discourse on language of instruction and literacy: Sound policy and Ubuntu or lip service? *Reconsidering Development*, 4(1), 1-16.

Bialystok, E. (2011). Reshaping the mind: the benefits of bilingualism. *Canadian Journal of Experimental Psychology/Revue Canadienne De Psychologie Expérimentale*, 65(4), 229.

Blankenbeckler, C. (2017). *Vamos Ler! (Let's Read!) program quarterly progress report 1, mobilization period: August 12 – December 31, 2016*. Published by Creative Associates International with USAID support. Retrieved from https://dec.usaid.gov/

Canhanga. M. & Banda. M. (2017). Education language policy in Mozambique: A critical view. *International Journal of Humanities Social Sciences and Education*, 4(5): 13-14

Capra International (2013). *Evaluation of the ministry of education bilingual education pilot in Mozambique*. Cumberland, ONT, Canada: Capra International Inc.

Chen, H. T., & Rossi, P. H. (1989). Issues in the theory-driven perspective. *Evaluation and program planning*, 12(4), 299-306.

Clayton, S. (2008). The problem of 'choice' and the construction of the demand for English in Cambodia. *Language Policy*, 7(2), 143.

Collier, V. P., & Thomas, W. P. (2004). The astounding effectiveness of dual language

education for all. *NABE Journal of Research and Practice*, 2(1), 1–20.

Creese, A., Martin, P. W., & Hornberger, N. H. (Eds.). (2008). *Ecology of language*. Berlin, Germany: Springer.

Cummins, J. (1979). Linguistic interdependence and the educational development of bilingual children. *Review of Educational Research*, 49(2), 222–251.

Cummins, J. (1984). *Bilingualism and special education: Issues in assessment and pedagogy* (Vol. 6). Clevedon, UK: Multilingual Matters.

Cummins, J. (2000). *Language, power, and pedagogy: Bilingual children in the crossfire* (Vol. 23). Clevedon, UK: Multilingual Matters.

Dehaene, S. (2009). *Reading in the brain: The new science of how we read*. New York, NY: Penguin Group.

Dowd, A. J., & Bartlett, L. (2019). The need for speed: Interrogating the dominance of oral reading fluency in international reading efforts. *Comparative Education Review*, 63(2), 189-212.

Dubeck, M. M., & Gove, A. (2015). The early grade reading assessment (EGRA): Its theoretical foundation, purpose, and limitations. *International Journal of Educational Development*, 40, 315-322

Eberhard, D. M., Simons, G. F., & Fennig, C. D. (Eds.). (2019). *Ethnologue: Languages of the World. Twenty-second edition*. Dallas, Texas: SIL International. Retrieved from http://www.ethnologue.com

Glouberman, S., & Zimmerman, B. (2002). Complicated and complex systems: what would successful reform of Medicare look like?. *Romanow Papers*, 2, 21-53.

Gove, A., & Cvelich, P. (2011). *Early reading: Igniting education for all. A report by the early grade learning community of practice*. Research Triangle Park, NC: RTI International.

Gove, A., & Wetterberg, A. (2011). *The Early Grade Reading Assessment: Applications and*

Interventions to Improve Basic Literacy. Research Triangle Park, NC: RTI International.

Graham, B. E., & van Ginkel, A. J. (2014). Assessing early grade reading: the value and limits of "words per minute." *Language, Culture and Curriculum*, 27(3), 244-259.

Hamid, M. O., & Erling, E. J. (2016). English-in-education policy and planning in Bangladesh: A critical examination. In R. Kirkpatrick, (Ed.). *English language education policy in Asia* (pp. 25-48). New York, NY: Springer.

Hoffman, J. V. (2009). In search of the "simple view" of reading comprehension. In S.E., Israel & G. G. Duffy (Eds.). *Handbook of research on reading comprehension* (pp. 78-90). New York: Routledge.

Hoover, W. A., & Gough, P. B. (1990). The simple view of reading. *Reading and writing*, 2(2), 127-160.

Hornberger, N. H. (2002). Multilingual language policies and the continua of biliteracy: An ecological approach. *Language policy*, 1(1), 27-51

Hornberger, N. H. (2006a). Frameworks and models in language policy and planning. In T. Ricento (Ed.). *An introduction to language policy: Theory and method* (p. 24-41). Malden, MA: Blackwell Publishers.

Hornberger, N. H. (2006b). Voice and biliteracy in indigenous language revitalization: Contentious educational practices in Quechua, Guarani, and Māori contexts. *Journal of Language, Identity, and Education*, 5(4), 277-292.

Hornberger, N. H. (2009). Multilingual education policy and practice: Ten certainties (grounded in indigenous experience). *Language Teaching*, 42(2), 197-211.

Hovens, M. (2002). Bilingual education in West Africa: Does it work? *International Journal of Bilingual Education and Bilingualism*, 5(5), 249-266.

Hua, H., Noyes, D., Van de Waal, W. & Turney, A. (2017). *Qualitative study of teacher knowledge, attitudes, & practices (KAP) in Mozambique, Final Report*. Published by Creative Associates International with USAID support. Retrieved from https://dec.usaid.gov/

Jasińska, K. K., Wolf, S., Jukes, M. C., & Dubeck, M. M. (2019). Literacy acquisition in multilingual educational contexts: Evidence from Coastal Kenya. *Developmental science*, e12828.

Johnson, D. C. (2013). *Language Policy*. London: Palgrave Macmillan.

Koda, K. (2007). Reading and language learning: Crosslinguistic constraints on second language reading development. *Language Learning*, 57, 1-44.

Koda, K., & Zehler, A. M. (Eds.). (2008). *Learning to read across languages: Cross-linguistic relationships in first-and second-language literacy development*. New York, NY: Routledge.

Maddy-Weitzman, B. (2011). *The Berber identity movement and the challenge to North African states*. Austin, TX: University of Texas Press.

Mann, M., & Dalby, D. (2017). *A thesaurus of African languages: A classified and annotated inventory of the spoken languages of Africa with an appendix on their written representation*. New York, NY: Routledge.

May, S. (2005). Language rights: Moving the debate forward. *Journal of Sociolinguistics*, 9(3), 319-347.

Ministério da Educação e Desenvolvimento Humano (MINEDH). Instituto Nacional de Desenvolvimento da Educação (INDE). (2001, 2003). *A modelo de transição como características de manutenção*. Mozambique: MINEDH.

Minsterio da Educação e Desenvolvimento Humano (MINEDH) (2019). *Estratégia*

nacional de expansão do ensino bilíngue. Mozambique: MINEDH.

Nakamura, P. R., Carson, C., Davis, E., Rai, N., & Todd, A. (2018). *Language Mapping Study in Mozambique, Final Report*. Published by Creative Associates International with USAID support. Retrieved from https://dec.usaid.gov/

Nakamura, P. R., de Hoop, T., & Holla, C. U. (2018). Language and the learning crisis: Evidence of transfer threshold mechanisms in multilingual reading in South India. *The Journal of Development Studies*, 1-19.

National Reading Panel. (2000). *Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction*. Washington DC: National Institute of Child Health and Human Development.

Ouane, A., & Glanz, C. (2010). *How and why Africa should invest in African languages and multilingual education*. Hamburg, Germany: UNESCO Institute for Lifelong Learning.

Piper, B., Schroeder, L., & Trudell, B. (2016a). Oral reading fluency and comprehension in Kenya: Reading acquisition in a multilingual environment. *Journal of Research in Reading*, 39(2), 133-152.

Piper, B., Zuilkowski, S. S., & Ong'ele, S. (2016b). Implementing mother tongue instruction in the real world: Results from a medium-scale randomized controlled trial in Kenya. *Comparative Education Review*, 60(4), 776-807.

Perfetti, C. A., & Dunlap, S. (2008). Learning to read: General principles and writing system variations. In K. Koda & A. M. Zehler (Eds.). (2008). *Learning to read across languages: Cross-linguistic relationships in first-and second-language literacy development* (pp. 25-50). New York, NY: Routledge.

Pflepsen, A. (2015). *Planning for language use in education: Best practices and practical*

steps to improve learning outcomes. *Prepared for USAID Bureau for Africa*. Research Triangle Park, North Carolina: Research Triangle Institute. Retrieved from https://www.globalreadingnetwork.net/sites/default/files/eddata/Language_Use_in_Education_guidance_May_2016_FINAL.pdf

Potter, P. & Blankenbeckler, C. (2018). *USAID Vamos Ler! (Let's Read!) FY 18 annual report: October 2018-September 2018*. Published by Creative Associates International with USAID support. Retrieved from https://dec.usaid.gov/

Ricento, T. (2000). Historical and theoretical perspectives in language policy and planning. *Journal of Sociolinguistics*, 4(2), 196-213.

Rogers, P. J. (2008). Using programme theory to evaluate complicated and complex aspects of interventions. *Evaluation*, 14(1), 29-48.

Ruiz, R. (1984). Orientations in language planning. *NABE Journal*, 8(2), 15-34.

Shulman, S (2017). *Qualitative study of community knowledge, attitudes, & practices (KAP) in Mozambique, Final Report*. Published by Creative Associates International with USAID support. Retrieved from https://dec.usaid.gov/

Skutnabb-Kangas, T. (2000). *Linguistic genocide in education – or worldwide diversity and human rights?* Mahwah, N.J.: L. Erlbaum Associates.

Skutnabb-Kangas, T., & Heugh, K. (Eds.). (2012). *Multilingual education and sustainable diversity work: From periphery to center*. New York, NY: Routledge.

Stanovich, K. E. (1986). Matthew effects in reading - Some consequences of individual-differences in the acquisition of literacy. *Reading Research Quarterly*, 21(4), 360–407.

Tan, L. H., Spinks, J. A., Feng, C. M., Siok, W. T., Perfetti, C. A., Xiong, J., Fox, Peter T., & Gao, J. H. (2003). Neural systems of second

language reading are shaped by native language. *Human Brain Mapping*, 18(3), 158-166.

Tinsley, T. (2013). *Languages: the state of the nation. Demand and supply of language skills in the UK*. London, UK: British Academy.

Tollefson, J. W. (Ed.). (2002). *Language policies in education: Critical issues*. New York, NY: Routledge.

Trudell, B., & Piper, B. (2013). Whatever the law says: Language policy implementation and early-grade literacy achievement in Kenya. *Current Issues in Language Planning*, 15(1), 4-21.

Turney, A., Noyes, D., Dhliwayo, T. M., Machkasov, Y., Van de Waal, W. & Hua, H. (2018). *Effectiveness Evaluation Baseline Report – Mozambique*. Retrieved from https://dec.usaid.gov

UNESCO (1953). *The use of the vernacular languages in education. Monographs on Foundations of Education, No. 8*. Paris, France: UNESCO.

UNESCO (2003). *Education position paper: Education in a multilingual world*. Paris: UNESCO. Retrieved from https://unesdoc.unesco.org/ark:/48223/pf0000 129728

UNESCO (2014). *Teaching and learning: achieving quality for all (Education for All Global Monitoring Report 2013/4)*. Paris, France: UNESCO. Retrieved from http://unesdoc.unesco.org/images/0022/00225 6/225660e.pdf

UNESCO (2016). *Education for people and planet: Creating sustainable futures for all (Education for All Global Monitoring Report 2013/4)*. Paris, France: UNESCO. Retrieved from https://unesdoc.unesco.org/ark:/48223/pf0000 245752

UNESCO (2019). *Report of the secretary-general. Special edition: Progress towards the sustainable development goals*. Paris, France:

UNESCO. Retrieved from https://undocs.org/E/2019/68

United Nations (2008). *United Nations declaration on the rights of indigenous peoples*. New York: United Nations. Retrieved from https://www.un.org/en/genocideprevention/do cuments/atrocity-crimes/Doc.18_declaration%20rights%20indige nous%20peoples.pdf

USAID (2012, April). *USAID 2011 education strategy: Technical notes*. Washington, DC: USAID. Retrieved from http://pdf.usaid.gov/pdf_docs/PDACT681.pdf

USAID (2018, November). *USAID education policy: Program cycle implementation and operational guidance*. Washington, D.C.: USAID. Retrieved from https://www.usaid.gov/sites/default/files/docu ments/1865/USAID_Education_Policy_Progra m_Cycle_Implementation_and_Operational_G uidance_FINAL.pdf

United States Government [website]. (n.d.). Resources retrieved in October, 2019, from https://www.grants.gov/learn-grants/grant-making-agencies/agency-for-international-development.html and https://beta.sam.gov/

Walter, S., & Benson, C. (2012). Language policy and medium of instruction in formal education. In B. Spolsky (Ed.), *The Cambridge handbook of language policy* (pp. 278-300). Cambridge, UK: Cambridge University Press.

Wardhaugh, R. (2011). *An introduction to sociolinguistics* (Vol. 28). Hoboken, NJ: John Wiley & Sons.

Weiss, C. H. (1997). How can theory-based evaluation make greater headway? *Evaluation Review,* 21(4), 501-524.

Weiss, C. (1998). *Evaluation: Methods for studying programs and policies*. Englewood Cliffs, NJ: Prentice Hall.

Wiley, T. G. (2012). A brief history and assessment of language rights in the United

States. In *Language Policies in Education* (pp. 73-102). NY: Routledge.

Wolf, M. (2008). *Proust and the squid: The story and science of the reading brain.* Cambridge, UK: Icon.

Ziegler, J. C., & Goswami, U. (2006). Becoming literate in different languages: Similar problems, different solutions. *Developmental Science,* 9(5), 429-436.

About the Author

Corrie Blankenbeckler is a senior technical advisor in the Education Division at Creative Associates International. She has over fifteen years' experience in developing and managing formal and non-formal education programs in diverse environments in the Middle East/North Africa, Sub-Saharan Africa, and Asia. In her current role, she leads in program design and provides technical quality assurance and support for Creative projects around the world. Since 2016 she has provided project direction and technical support for the bilingual early grade reading project in Mozambique. She has an M.A. in international education development from Teachers College of Columbia University, and has deep expertise in mother-tongue based multilingual curriculum design.