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ADDITIVE LANGUAGE LEARNING FOR MULTILINGUAL SETTINGS

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GLOSSARY

Affix is a morpheme (prefix, infix or suffix) that cannot stand on its own, but needs to be attached to other morphemes/the root of a word.

Affixation is the process of using affixes to change words.

Agglutinative languages are languages in which there is a strong tendency for many affixes to be attached to the root of words; because of that the languages have long words.

Bilingual education is education that uses two languages for instruction.

Derivational morphology is the process of creating a new word by changing an existing word. When adding a morpheme to a word it does not only change meaning, but also word category. For example in English 'teach' is a verb, but when adding –er 'teacher' it has become a noun.

Foreign language is a language that is not spoken in the immediate environment.

Mother Tongue is, for the purposes of this paper, the language spoken at the home of child and the language a child knows best when he/she comes to school.

Multilingual education is education that uses more than two languages in instruction. In general, a multilingual education program is a structured program that aims to develop cognitive, language, and literacy skills in the first language and the additional language(s). It does so by making use of the students' first language as the medium of instruction for part of the curriculum.

Second language is a language that is spoken in the immediate environment and is also heard outside school.

Script is the visual appearance of a writing system.

Writing system is a method of organizing the principles that guide how the symbols are mapped onto the language unit.

CONTENTS

INTRODUCTION

Most people around the world speak more than one language and many more would like to do so. Africa, for example, is home to about one-third of the world's languages, and most people there use multiple languages to communicate in different domains and settings. Yet the rich linguistic environment of most countries has been a challenge for policy makers and educators, who are faced with difficult questions: what should a language policy for education look like? How do children learn to read in different languages? What level of knowledge of a language is required before children benefit from education using a new language as a medium of instruction? This paper aims to answer this last question: when can the medium of instruction successfully include more than the mother tongue? It also explores ways to determine this threshold level of knowledge and whether this threshold level is different for different languages.

Countries have chosen different approaches to bilingualism and multilingualism. In general, however, there are two main scenarios regarding language in education. The first is that a country has one dominant language that almost every one speaks, but it wants to have multilingual citizens who can interact freely in different languages and be global citizens. This is the situation in many countries in Europe (Language Policy Unit, n.d.; Tragant, 2010).[1] The other is that a country has many languages and a strong desire that every citizen learns one or two languages in addition to his or her mother tongue so that the people can communicate with each other as a nation and be global citizens. This exists in many countries in Africa, Asia, and Latin America. Moreover, in most of these countries the language of the colonizer has left a strong footprint on people's beliefs and perceptions about language education.

Although both scenarios have the same goal of multilingual citizens, the process to achieve this goal is different in each case. In the first scenario, there is often a strong tradition of teaching in a language children understand—the mother tongue— throughout the school years. In Finland, Denmark, and The Netherlands, for example, the mother tongue is the medium of instruction for most students from primary school up to the university level. In fact, in several European countries that have more than one native language, parents can choose which language they prefer for their child as a medium of instruction. For instance, in Spain, primary education is provided in Spanish, Basque and Catalan (Chenoz, 2008; Moreno, 2008). In the province of Friesland in The Netherlands, parents can choose either the native language spoken there, Frisian, or Dutch as a medium of instruction for primary and even secondary school (Gorter & van der Meer, 2008).In general using the language students know as a medium of instruction has resulted in good education outcomes, but, to a lesser extent, multilingual citizens (Fontecha, 2009). However, in the last few years, Europe has made considerable progress in working toward multilingual—or what are sometime termed "plurilingual"—citizens (Language Policy Unit, n.d.). This interest in plurilingualism has led to many research projects aimed at gaining insight into how young students best learn other languages. Bilingual schools are emerging, and additional languages are being piloted with young students (J. Enever, Moon, & Raman, 2009). Also, in the last few years, university courses are increasingly offered in English, rather than just the dominant native language. Interestingly, the countries that produce the most proficient English language speakers are countries that do not use English as medium of instruction in school (Education First, 2013).

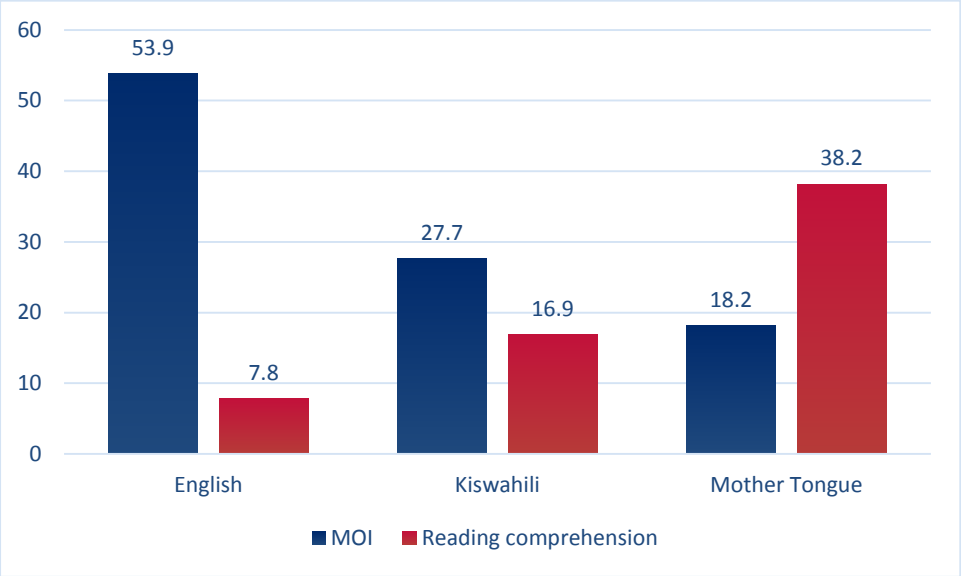
In multilingual countries that follow the second scenario, children leave the mother tongue as soon as possible and continue education in the official language—often the language inherited from the colonizer—even though they do not speak this language when they enter school, nor is it spoken at home. Consequently, most children in Africa find themselves having to try to learn through a language they do not understand (Alidou, Boly, Brock-utne, & Satina, 2006; Djité, 2008; J. Enever et al., 2008; Ouane & Glanz, 2006), and many of them fail in education.

1. This paper discusses several terms that relate to bilingual and multilingual education. The focus is, in particular, on learning to read and write in bilingual and multilingual education (bi/multilingual education) settings.

In several African countries, the mother tongue is recognized as having a place, particularly at the policy level, but strong assumptions about the colonial languages—made by parents, teachers, and education officials alike—hinder the implementation and use of the mother tongue in education. The language of the colonizer is often the language used as a medium of instruction in education. In Africa, this language is frequently seen as the language of success and socio-economic development (Djite, 2008). "Many parents, especially in rural areas, express the view that they send their children to school to learn the official language (English, French, or Portuguese), and that a policy forcing them to learn an African language amounts to a dumbing down of their children and keep them at the bottom of the socio-economic scale" (Djite, 2008, p. 21). One rather persistent assumption is that the earlier children start to learn the colonial language, the better they will be at it, and that longer learning of the language will give higher results (Alidou, Boly, Brock-utne, & Satina, 2006). However, this assumption is not well supported by research conducted in Europe or Africa (Alidou et al., 2006; J. Enever et al., 2009; Heugh, Benson, Berhanu, & Yohannes, Mekonnen, 2007). In some specific contexts, such as in Canada, this submersion approach in which only the new language is used has worked well. However, using English as a medium of instruction in settings where it is only used in school does not result in good learning outcomes for the English language or other subjects (Heugh et al., 2007).

Research from primary schools in Africa, where English is used as medium of instruction (MOI) in the early grades but is barely spoken if at all outside the classroom, shows that very little learning is taking place (Piper, 2010; Uwezo, 2010). The Early Grade Reading Assessment (EGRA) carried out in Kenya shows this in greater detail. (See Figure 1.) Kenya has a policy stating that the mother tongue should be used as the MOI in classes 1-3. The reality is that teachers use English most of the time, 53.9 percent, as compared to 27.7 percent Kiswahili, a national language, and 18.2 percent in the mother tongue (Piper, 2010). Yet children scored only 7.8 percent on the reading comprehension test in English; they scored more than twice as well—16.9 percent—in Kiswahili, and almost five times better—38.2 percent—in the mother tongue. In most of the cases, children were not even taught how to read in their mother tongue, yet they were able to transfer what they had learned in Kiswahili and English to the language they knew best, the language they learned at home.

Figure 1. EGRA Results Rural Central Province, Kenya (Piper, 2010)



Additional research shows that starting education in a language children do not understand does not yield high learning results, nor does it help children to learn the new language well (Alidou et al., 2006; Mothibeli, 2005). Research from Europe shows that young students who had 3 to 4 years of language learning did not reach a sufficient level of language skill for teachers to be able to use the added language as an MOI in the classroom (J. Enever et al., 2009).

However, reading comprehension data from Eritrea shows that children who learn to read in a foreign language take 5 or 6 years to reach the same level of reading comprehension that children who learn in the mother tongue reach in 3 years or less (S. L. Walter, n.d.). Research from a bilingual education program in Cameroon shows that students who learn in their mother tongue and learn English as a subject perform better on English language tests than children who learn in English all the time (Walter & Trammell, 2010). Similar results are reported from South Africa (Taylor & Coetzee, 2013). These data show that teaching in a language that students do not understand or have not learned well yields poor cognitive results; the students lag behind their peers who receive education through a MOI that they understand.

It is commonly believed that the earlier children start to learn a language, the better they learn it. However, research from countries in Europe revealed that young students who started to learn English at 10–11 years of age progressed more in two years' time than very young 4-6 year old students (J. Enever et al., 2009; Muñoz, 2008; Nikolov, 2009). Older children appear to perform better in instructional settings because of their cognitive maturity. Also, instruction that is only a few hours per week is more suitable for older learners. Teaching a foreign language to students who are 9 to 11 years old, therefore, is more productive. However, very young learners have a few advantages: they acquire the sound system of the language more easily and they are less anxious about learning a new language. Further, when children start at a very early age, language learning is largely an intuitive process; as they grow older, processing becomes more analytical. The two learning processes combine to help the new language become deeply embedded in their brains. Also, learning an additional language has a positive influence on the general educational development of the learners (Johnstone, 2002).

Certain key conditions should be in place for language learning to be effective with very young learners. The conditions are contextually bound, but examples include (Djigunovich & Vilke, 2000):

- Intensive interaction in class;
- Instruction for 45 minutes per day, five days per week;
- Class size of 10–15 children;
- Teachers who have a good command of the language.

Identifying key context conditions is critical. "…if any of the requirements are missing, second language instruction should not begin at an early age; a negative experience may harm children's attitude to the target language and to language learning in general"(Nikolov, 2000, p. 43). Older children, 10 years of age or more, have some learning advantages also. They can use concepts learned in their first language (L1) to "plot" the new language; the very young learners still have to learn those concepts. Moreover, older learners are more experienced in different language activities and may gain more from feedback and negotiating meaning. Having acquired a wider range of strategies, they are more efficient learners, have a better understanding of why they are learning an additional language, and may be more purposeful in working towards their own objectives (Johnstone, 2002).

The research suggests that the advantages different age groups have when learning new languages should be considered and utilized. For example, if a language is to be taught in a classroom setting, it may be better to start the added language after students have had 3 or 4 years of primary school. These students will take less time to learn as much of the new language as learners who started in their first year of primary school. Additionally, transitioning to using the new language as MOI is not a must. In fact, there is sufficient evidence that using the added language as MOI too early may even be detrimental to language learning and other learning.

The key question is how to best use language to optimize learning for children living in environments where more than one language is spoken and where it is necessary to be bi/multilingual citizens. Ignoring the languages that children speak at home and expecting them to come to school with inherent knowledge of the language(s) of instruction is not an option.

APPROACHES TO COMBINING LANGUAGES

There are three main approaches to combining languages in bi/multilingual education: the subtractive or submersion approach, the transitional approach, and the additive approach (Alidou et al., 2006; Bot & Herder, 2008; Unsworth, Bot, Persson, & Prins, 2012). The underlying philosophies of these approaches express different messages about the value and importance of the languages spoken by people in bi/multilingual settings.

The goal of the ***subtractive or submersion approach*** is to enable the learner to acquire the official language as the medium of instruction as soon as possible. The first language is hardly present in education and is not maintained. The child's background, linguistic heritage, and culture are not acknowledged. The submersion approach assumes "the earlier the better" and "the longer the better."

The goal of the ***transitional approach*** is also to enable the learner to acquire the official language, but the learner's first language is used for some years during primary education. There is a gradual transition in which the child's mother tongue is left behind and a new language—often a foreign, former colonial language—replaces it. This approach is also referred to as subtractive bilingualism (Cummins 1994). The second language is added at the expense of the first language. This is the approach in many countries in Africa, Asia, and Latin America.

Finally, the goal of the ***additive approach*** is that students have high proficiency levels in the first language and the other language. Both languages are used in education, and the first language continues to be developed. A second (and often a third) language is added as an enrichment of the first one. This approach to multilingualism values the language of each individual. It respects the individual's background, linguistic heritage, and culture. It helps children to develop high proficiency levels in their mother tongue and the language of wider communication.[2] This is the approach in most European countries.

A closer examination of these approaches provides important information about the contexts where they have been used, when success was achieved, and what factors led to success in which contexts. The choice of approach also communicates a message about the value of an individual's linguistic and cultural heritage. Such messages have long term consequences for people's self-esteem and the cultural and linguistic diversity of nations.

2. For a more in-depth discussion, see Alidou et al., 2006.

BI/MULTILINGUAL EDUCATION AND TRANSFER ISSUES

In bi/multilingual education, two or more languages interact in a person's mind, influencing each other in positive and negative ways. The languages are not separate units, but interlinked in the brain, where transfer from one language to the other can take place (Cook, 2003). Cummins (1979) postulated the linguistic interdependence hypothesis, which states that in bilingual development, language and literacy skills can be transferred from one language to another.

Research with young bi/multilingual students has shown that reading acquisition in the new language uses similar underlying skills and strategies as in the first language (Arab-Moghaddam & Sénéchal, 2001). Having developed phonological awareness in their first language helps students to transfer that skill to the new language(s). However, this implies that young students need to have sufficient knowledge of the new language to hear syllables and individual sounds. Clearly, the transfer of reading skills and strategies from first language to the new languages depends on the student's reading ability in the first language and language ability in the new language. Research with young bi/multilingual students learning to read a new language also shows that oral language competencies aid decoding and word recognition (Bossers, 1991; Carrell, Devine, & Eskey, 1998). The extent or ease with which the transfer of reading skills and strategies takes place depends on the language and writing system. For instance, for most students in Africa, the European languages used in education are very different from their mother tongues in grammar, vocabulary (no cognates), concepts, writing systems, and scripts. However, for most students in Europe, the linguistic distance between their mother tongue and English is not that far. There are similarities in concepts, vocabulary, writing system and script, and positive transfer can take place. Linguistic distance between the known language(s) and the new language influences the speed with which new languages are acquired (Chiswick & Miller, 2004).

The differences between writing systems and scripts also influence transfer. A writing system consists of the principles that guide how symbols are mapped onto language units, and script refers to the visual appearance of a writing system (Piper & Van Ginkel, 2014). Conceptually, writing system and script are independent from each other, and they influence the reading process differently (Almabruk, Paterson, McGowan, & Jordan, 2011; Coderre, Filippi, Newhouse, & Dumas, 2008; Coulmas, 1996; Nag, 2007). Learning to read in one language with a certain writing system and script takes a different trajectory from learning to read in another (Asfaha, Kurvers, & Kroon, 2009; Nag, 2007; Seymour, Aro, & Erskine, 2003). This means that for any additional language learned, students need to acquire the writing system of that language and often also a new script. For example, in Ethiopia, students who learn in alphabetic script languages, which are phoneme based, need to learn Amharic, which has an alphasyllabic script based on syllables and more than 240 symbols. These students likewise need to learn the writing system of English, which is much less predictable than their own mother tongues, which often have regular sound and symbol relationships (Piper & Van Ginkel, 2014).

Research has also shown that transfer of reading skills and strategies between languages is influenced by different linguistic variables including the transparency of the writing system, and its syllable structure, word length, symbols, phonological unit, agglutination, and word frequency (Duibhir & Cummins, 2012; Seymour et al., 2003; Van Ginkel, 2008; Ziegler et al., 2010). This knowledge about learning to read in a bi/multilingual setting implies that there is not one method or approach that could work for all contexts.

Besides the linguistic elements, other variables such as the language level of teachers, the motivation of young students, the method used, the hours per week spent on language instruction and learning, the amount of exposure to the new language outside the classroom, and the perceived value of the additional language and the first language all play important roles (Bot & Herder, 2008; Enever et al., 2009; Marianne Nikolov, 2006; Thijs, Trimbos, Tuin, Bodde, & de Graaff, 2011; Unsworth et al., 2012). Again, this shows the complexity of bilingual/multilingual education and the importance of understanding the context in which bi/multilingual education takes place.

THRESHOLDS AND COMPETENCIES

One of the most urgent issues for policy makers and educators in multilingual settings is how to know when students have enough knowledge of an added language to benefit from it as a medium of instruction in education. What is the threshold level for a given language? While policy makers would prefer to know how many years of education it would take to reach this level, to express this level in years of education would be misleading. It would assume that the context for each child, class, and education system was the same. But contexts differ in many ways: the use of the foreign language outside of the school setting, the language level of the teachers, the materials available for language learning, the number of students in the class, the hours of language learning, etc. (Enever et al., 2009; Language Policy Unit, n.d.; Unsworth et al., 2012). A better way to express the threshold level would be to know when language users have achieved sufficient skills so that education could start to take place in the other language. It would also be useful to know what skills are contained in that threshold level. In 1979, Cummins presented this language threshold as a hypothesis, which is now known as the linguistic threshold hypothesis. The linguistic threshold hypothesis states that a linguistic threshold is a necessary point that a bilingual student must reach in order to benefit from bilingualism (Cummins, 1979). There are two ways of looking at the linguistic threshold level: knowledge level or user competence.

VOCABULARY SIZE AS A THRESHOLD

To take knowledge level as a threshold means looking at what language knowledge (linguistic knowledge) users need to know to be able to do well in the classroom. Research shows that limited language proficiency hinders transfer of reading and other skills from the first language to the new language (Bossers, 1991; Carrell et al., 1998). Of late, applied linguists have moved from looking at grammar to looking at vocabulary because research has shown that the language threshold for reading is largely based on the vocabulary size of the language user (Eyckmans, 2004; Hirsh & Nation, 1992; Nation, 2006). Before successful reading can take place in the new language, sufficient knowledge of words in that language needs to be present. The question is how large a vocabulary is necessary in order to begin to read and write in the other language?

Vocabulary size is often measured in word families in which the base word and all its inflected and derived forms count as one (Nation, 2006). This assumes that, when reading and listening, a learner who knows at least one member of a word family could understand other members by using knowledge of the most common and regular English word-building devices (Nation, 2006). However, other studies have shown that it is important for English language students to also learn derivational morphology—the process of forming a new word on the basis of an existing word—in order to be more successful (Kieffer & Lesaux, 2007).

Nation (2006) recommends that language students learn high-frequency and academic vocabulary. In the early stages of language learning, this is particularly important because students' language use depends heavily on the number of words they know. Nation states that a significant threshold in English is about 2,000 word families. When students know fewer words, the materials they use need to be simplified and graded at their level. Graded readers use limited vocabulary to support the early language students; the students encounter the words often and learn the words better. Nation and Wang (1999) suggest that about 10 repetitions of words are necessary for students to retain the word and its meaning, but more repetitions are better. Teaching the most frequent words to young students is also helpful for languages other than English. Languages have different vocabulary sizes for threshold levels; they also have varied affixation and word length, all of which affects frequency calculations. Agglutinative languages will need a different calculation, probably also including frequent morphemes. Research is starting to confirm that languages indeed differ in how many words need to be learned to reach a threshold. The threshold level for French as a foreign language seems to be about 2,200 frequent words, while the threshold level for Greek as a foreign language is about 3,350 frequent words (Milton, 2001).

There is a strong link between vocabulary knowledge and reading comprehension (Milton, 2001; Nation, 2006).To read with reasonable ease means that at least 95 percent of the words in a text are known. When 97 to 98 percent of the words are known, unassisted comprehension can take place (Hirsh & Nation, 1992; Nation, 2006). The 2,000 most frequent words in English cover about 80 percent of all text, which means that unassisted comprehension is still quite difficult when only knowing these 2,000 words. Researchers tend to agree that, in English, a vocabulary of about 3,000 to 5,000 words is necessary for students to read authentic text (Eyckmans, 2004). This suggests that for an English language learner to benefit from reading non-graded materials he needs to learn at least 3,000+ words, including the 2,000 most frequent ones. It seems that knowledge of the most frequent words in a new language is crucial for comprehension to take place in English and other languages (Milton, 2001).

A question of interest is how long does it take English language learners to learn 3,000 or more words so that they can read non-graded materials? While students whose mother tongue is English have acquired about 4,000 to 5,000 word families by the age of 5 and learn about 1,000 new word families each year, a realistic target for children learning English as a foreign language might be around 500 word families a year, given good learning conditions. Nation (1990) describes studies showing that after 5 years of regular lessons, children in India and Indonesia had between 1,000 to 2,000 word families. In Hungary, young students learning English as a foreign language learn about 1,460 words after 4 years of education (about 4 words per contact hour), while in Greece young students learned about 2,280 words in 4 years (about 5–6 words per contact hour) (Orosz, 2009). This seems to indicate that it would take more than 5 years of education for children to reach a level of vocabulary knowledge that would allow them to use the English language comfortably and to understand the content of their school books and teachers' instruction.

Nevertheless, vocabulary size as a threshold has its limitations. Although it might be effective to teach the most frequently used words in the early stages of language learning, the actual benefit for learners will depend on the task, domain, and context in which the words will be used. With young students, it is important to teach the words that are needed for learning new things in class and for following instructions, not just everyday words. Furthermore, just teaching vocabulary to reach the critical threshold is not sufficient. Young language students need to learn strategies that enable them to learn more words by themselves in order to be prepared for a change in the medium of instruction. They need to be able to figure out the meaning of words they do not yet know. Additionally, knowledge of the structure of the new language and how text is built in the language are crucial in transferring reading comprehension skills (C. Walter, 2004).

Thus, to only use vocabulary size as a threshold measure would not be sufficient. More than linguistic knowledge is necessary for learning to be successful.

LANGUAGE COMPETENCIES

Another way to look at language learning is to look at what students are able to do with the new language. In different settings, assessment scales have been developed to measure language learning based on competency. The United Kingdom uses the Common Scale for English as Additional Language or EAL (Qualifications and Curriculum Authority, 2000), while the European Union has developed a framework that can be applied to all languages in Europe called the Common European Framework Reference for Languages (CEFR) (Language Policy Unit, n.d.; Little, Goullier, & Hughes, 2011). The CEFR has become an influential instrument in language teaching and learning in Europe and beyond. All important language exams in Europe (Cambridge, IETS, TOEFL, etc.) are mapped on the CEFR.

Although both EAL and CEFR have been developed for contexts in Western countries, they are instructive because they use competency-based indicators; in particular, the CEFR provides a framework for multilingual settings. All languages in Europe can be taught, learned, and assessed using this framework. A similar framework might be helpful for multilingual Africa.

The CEFR indicates a 'threshold' level at which a language student has developed sufficient competencies to be an independent user of the language. (See Table 1.)

Table 1. Six Levels of the CEFR

A Basic User	**B Independent User**	**C Proficient User**
A1 Breakthrough or beginner **A2** Way stage or elementary	**B1** Threshold or intermediate **B2** Vantage or upper intermediate	**C1** Effective operational proficiency or advanced **C2** Mastery or proficiency

The minimal level necessary to function independently in the new language and learn through it is the B1 threshold or intermediate level. This level is important for bi/multilingual education as it can be expected that language users have sufficient knowledge of the additional language for it to be used as a medium of instruction. According to the CEFR, on the global scale the language user:

- "Can understand the main points of clear standard input on familiar matters regularly encountered in work, school, leisure, etc.;
- Can deal with most situations likely to arise while travelling in an area where the language is spoken;
- Can produce simple connected text on topics that are familiar or of personal interest;
- Can describe experiences and events, dreams, hopes and ambitions and briefly give reasons and explanations for opinions and plans" (Council of Europe, n.d., p. 24).

These indicators suggest what content needs to be taught for students to reach this level. It is more than just vocabulary. These indicators also provide guidance for pragmatic applications—actual use in real life contexts. However, vocabulary is still a useful indicator. Evidence from various studies show that vocabulary size can be related to the CEFR levels with some confidence. Because linguistic variables such as word length and morphology also play an important role in vocabulary size, some studies have done cross linguistic comparisons. The vocabulary size for the B1 threshold level for English is about 3,000 words, for French about 2,200, while for Greek about 3,450 (Milton, 2001).

The CEFR was not developed with very young students in mind, however. Instead, it focuses primarily on lower secondary age and older students (Little 2007). Research that focused on young students found that these scales do not always reflect how young students learn. Young students learn language in a "more erratic and recursive" way than is described by the CEFR levels (Enever, 2011, p. 33, 34).

Despite this limitation, a competency-based scale like the CEFR would be helpful for bi/multilingual education programs as it would allow educators to state what students need to be able to do (knowledge and skills). This, in turn, would help teachers select content to be taught: specific domains of vocabulary and types of text for reading and writing. Rather than just making a change in language of instruction after a certain fixed year, this would allow the new language to be added as a medium of instruction when the students were ready for it. Depending on contextual issues, this could be after 4 to 8 years of education.

CASE STUDIES FROM DIFFERENT COUNTRIES

In this section, case studies are presented to further understand what happened in different contexts when transition to another medium of instruction took place. The review is guided by the following questions:

- What is the language policy in the country?
- How many years of additive language teaching did students have before the transition took place?
- What is known about the language competencies the students had when the transition took place?
- What happened to the student's learning results following transition? What does that reveal about the competencies the students had developed in the added language?
- Did the students reach the threshold that would enable them to cognitively benefit from education when the new language is used as a medium of instruction?

ETHIOPIA

The language policy for education in Ethiopia states that children should start education in their home language. From year 1 onward they learn English as a subject, and from year 3 onward, Amharic is taught as an additional language. After 4 years of education, the different regions have the choice of continuing to use the home language or using English as a medium of instruction. The 11 regions in Ethiopia have made different choices. Some have the home language as a medium of instruction for 4 years of education, others for 6 years of education, and still others have decided to have the home language as the medium of instruction for 8 years of primary education.

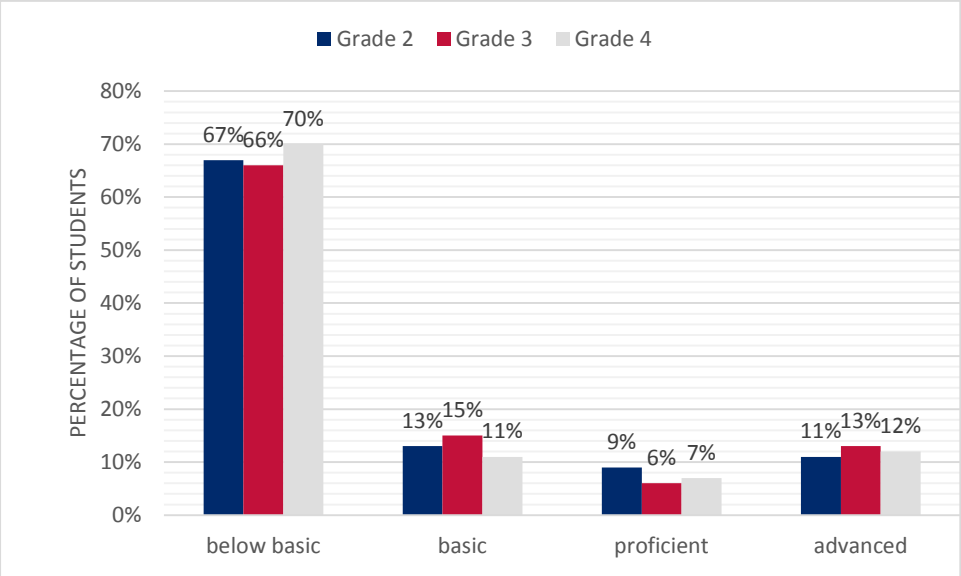
The earliest transition to English as MOI is in grade 5. An analysis of the English language curriculum for grades 1–4 shows that after 4 years of learning English as a subject, the students will have had to learn about 400 words (Smith, Stone, & Comings, 2012). Comparing this number to what is known about the approximate number of words a student needs to know as a threshold for being able to cognitively benefit from English as a medium of instruction, namely about 3,000 words (Nation, 2006), one can predict that transition at this point to English as MOI will be detrimental to learning results. The English EGRA results from Ethiopia show that after 4 years of education only 19 percent of the students in grade 4 (the sum of proficient and advanced level) have reached the required knowledge and skills of the minimal learning competencies for that grade. (See Figure 2.)

Further analyses of the data show that only 32 percent of the students in grade 4 had reached the grade-level proficiency of being able to "understand and use a total of about 400 words on different topics such as everyday objects, food, weather, animals, occupations, buildings, places, parts of the house, health, safety, tools, parts of the body, and everyday activities"(American Institute for Research, 2012, p. 22).

These data demonstrate that, based on what is known to be the threshold for the English language, the learning competencies for grade 4 stated in the current curriculum in Ethiopia are not sufficient. Moreover, even at the lower level set by the current curriculum, only 19 percent of students reach the national minimal learning competencies. Therefore, 4 years of teaching English as a subject in Ethiopia's lower primary schools is not sufficient to reach the curriculum goals of the country or to prepare young students to have English as an MOI. Other research shows that grade 8 students who had English as MOI in upper primary school are outperformed in all subjects by students who had their home language as an MOI and English as a subject (Heugh et al., 2007). Unfortunately, there are no data yet to show how the students who had their home languages as MOI are doing in secondary education where the language of instruction is supposed to be English. Further, we do not yet know if 8 years of learning English as a subject enables Ethiopian students to reach the threshold where

English can be used successfully as a language of instruction. Research might even show that more years of English as a subject and the mother tongue as an MOI would be better for students.

Figure 1. Data from Ethiopia: EGRA Results (American Institute for Research, 2012)



SOUTH AFRICA

Some very helpful information comes from South Africa, where data have long been collected on students leaving school at the end of 12 years of education. From 1955 until the early 1970s, children received their first 8 years of education in their mother tongue while they learned two other languages (Afrikaans and English) as subjects. After apartheid ended, the language policy was changed, and children received 4 years of education in their mother tongue/home language and during the fifth year English became the MOI.

Table 2. South Africa: Pass Rates at Matriculation Level (adapted from Heugh, 2012)

Year	African language speaking students	Percent (%) pass rate	Overall total number of candidates, plus % pass rate
1955	595	43.5	
1976	9595	83.7	
1979	14574	73.5	85,276 (87%)
1980	29973	53.2	109,897 (75%
1982	70241	48.4	139,488 (69%)
1992	342038	44	448,491 (56%)
1994	392434	49	495,408 (58%)
1997			559,233 (47.4%)
1998			552,862 (49%)

The pass rate on the final school-leaving examinations, which are in English, seems to show that the change in language policy had an effect on the learning results. The students who had 8 years of primary school in their home language scored well on the matriculation test, which is in English; this seems to indicate that they reached the threshold level and could do well in education with English as the medium of instruction. After the change in policy, however, there was a rapid decline in the percentage of students who passed the end of school test. South African research shows that the early switch to English does not work in the majority of South African schools (Heugh, 2012). Other possibilities are that more changes took place and the instruction was too poor for early transition. However, at this early transition, "[t]here is [a] gap between students' English proficiency and the linguistic demands of learning through the medium of English" (Probyn, 2006, p. 393).

A more recent analysis of data from standardized tests in English and mathematics conducted as part of the Annual National Assessment over a period of 5 years shows that "after controlling for school-fixed effects, receiving mother tongue instruction (rather than English instruction) in grades 1, 2 and 3 leads to better English proficiency in grades 4, 5 and 6."(Taylor & Coetzee, 2013 p. 19). Taylor and Coetzee show that school-fixed effects, such as school performance, also influence learning outcomes. In the high performing schools, students learn English better and can therefore start to use English as MOI earlier than in lower performing schools. This shows again that transition to an additional MOI should not be expressed in years of education, but rather should be based on competencies that can be acquired in a certain educational and linguistic context.

CAMEROON

In Cameroon, the policy states that during the first 3 years of education the mother tongue can be used as MOI, and that in year 4 either French or English are used as MOI. That means that students have 3 years to gain sufficient knowledge of English or French to be able to benefit from education in year 4 of primary school.

Interesting data have been presented by the Kom Experimental Mother Tongue Education Pilot Project (KEPP). This project collected data from students who started education with English as their MOI and from students who had their mother tongue as their MOI for years 1–3 and learned English as a subject. This longitudinal study collected data on students from primary school year 1 through year 5 and, thus, was able to see how the students dealt with the transition to a new MOI.

Initial results from KEPP showed that students who had their mother tongue as MOI outperformed students who had English as MOI in all subjects (Walter & Chuo, 2012; Walter & Trammell, 2010). Year 4 was the transition year when English became the MOI for all students. The data showed that having 3 years education with the mother tongue as MOI was not sufficient to prepare the students for the transition. The students' scores dropped considerably in years 4 and 5. Interestingly, the students who had been in an English-only class for all years of education scored lower and seemed even less prepared for the linguistic demands in class in years 4 and 5 than the KEPP students. Walter and Chuo (2012) attributed the higher scores of the KEPP students to the fact that their foundation in education was laid in their mother tongue, as this was the only difference between the two student populations.

A vocabulary test given to students in regular and KEPP schools in year 5 showed that the students in the comparison school scored only about 25 percent while the students in the KEPP schools scored about 33 percent on the test. The scores of both groups are low, but the KEPP students' scores were comparatively higher. These low scores, however, mean that the majority of students in both types of schools have not mastered the vocabulary necessary to cope with the academic content of year 5.

This study shows that 3 years of education with the mother tongue as the MOI and English as a subject provided better results in English than education with English as the MOI from the beginning. Thus, a more effective way to learn English is to have the mother tongue as MOI for all subjects. This seems consistent with the linguistic interdependence hypothesis: what is learned in one language is transferred to the other language. Further, this study shows that in this context, 3 years

of English as a subject is not sufficient to reach the threshold level to have English added as a MOI. The students were not ready for the linguistic, cognitive, and academic challenges associated with English as MOI.

These three case studies show that early transition to a new MOI is not beneficial for education outcomes in these contexts. In the case of Ethiopia, it was possible to compare the amount of vocabulary in the curriculum to a known threshold for vocabulary size to enable use of a language as MOI. The study from South Africa indicates that school factors play a role in the readiness to use a language as MOI, and policies should consider the individual school and/or linguistic setting.

MULTILINGUAL CLASSROOMS

The case studies above illustrate the advantages of instruction in a known language first for an extended period of time before transitioning to an additional language as a medium of instruction. However, in certain situations, more than one mother tongue a may be spoken in a classroom. This is often the case in urban settings or in areas where two, three or more language communities live closely together. Several questions arise in these situations: How should language and languages be treated in classrooms? What would be the best language for instruction?

Different solutions have been applied in different situations. In Ethiopia for example, there are often two streams of one grade, one stream provides education in the mother tongue, while the other one uses Amharic as a language of instruction (Gemechu, 2010). This is a practical solution when there is one dominant mother tongue and there is a group of students who do not speak the mother tongue being taught, or who share another mother tongue. In other situations, where there are a variety of mother tongues and it might not be possible to provide individualized mother tongue instruction for each student, research is needed on methods for determining the most effective language of instruction. It might be that most students are bi- or tri lingual and that all languages would help students cognitively benefit from education. However, it could also be that the young students only speak their mother tongue. In that case, there are a few options to choose from for instruction: use the languages (of the larger group of students) as a medium of instruction; use an African language (language of wider communication) that is not spoken by any of the students; use a foreign language that is later on used in school as a medium of instruction (English, French or Portuguese). The first option is often criticized because there is a belief that students whose language is not chosen will be disadvantaged. The second option is often criticized as well; it is argued that it would be better to use one of the European languages, as they will be used anyway and it gives students a head start with that language.

Research from Africa is starting to give insight on what is best for students when more than one mother tongue is spoken. In Cameroon, a small group of Fulfulde-speaking people are living in an area where most people speak Kom. For the Kom community, mother tongue education had been developed and it would have been easiest for the Fulfulde students to start in classrooms where Fulfulde would be the MOI. However, as the population of Fulfulde speakers was small, the education officials decided using the language as MOI would not be feasible. The Fulfulde students had two options: joining an English medium school or a Kom medium school. Research data showed that the Fulfulde-speaking students in the Kom medium schools outperformed the Fulfulde-speaking students in the English medium school by 72 percent in Grade 2, and by 127 percent in grade 3 (Walter, n.d.). Thus, the assumption that an international language as the MOI in mixed language classes does not hold in this case.

Other research shows that when there is a large group of mother tongue speakers of one language, children living within that context benefit from mother tongue-based multilingual education. In an environment with mixed language groups, using a language of wider communication is beneficial for children (Walter, n.d.).

This research indicates that in multilingual environments, it is important to understand the context to determine what type of education would be most practical and beneficial for children in that situation. When two language communities are living together it might be possible to have two streams in one grade, each providing education through the mother tongue that applies to children in the group. It may be that children in these contexts are bilingual and know, or are familiar with, the language of 'the other group'. Thus, they can also benefit from education in the 'other group' language. A European language should only be considered as a MOI when the aforementioned options are not possible.

SUMMARY

This paper reviews existing research and provides case studies in three countries to investigate approaches to providing bilingual and multilingual education. Preliminary answers to the following questions are explored: When can the MOI successfully include other languages besides mother tongue? How can this threshold level be determined? Is this threshold different for different languages?

Two measures for threshold levels have been highlighted: one based on vocabulary size, the other based on competencies. Vocabulary size as a measure of language learning is helpful for providing guidance on how many word families should be learned in order to reach the threshold, which differs across languages. To efficiently determine the words students should learn, focus on words used most frequently in that language. The selection of words, therefore, depends on the language. Further, vocabulary knowledge (and size) is a good indicator for reading comprehension. Unassisted comprehension can only take place when at least 95 percent of the words in text are known. It is crucial that students acquire sufficient vocabulary before a language is used as a MOI. Research suggests that in school settings, students learn between 300–600 words a year.

However, language learning and language use depends on more than just vocabulary. Understanding the structure of a new language and how text is built in the language are important factors that aid transfer of reading skills from one language to another. Vocabulary size does, however, provide an indication of when a student has reached the threshold of being able to function and learn through the new language. Information on competencies, such as the standards in the Common European Framework Reference for Languages (CEFR), can help curriculum developers by setting objectives to guide content decisions for curricula, textbooks, and other materials. The CEFR levels can also be used to guide decisions on vocabulary size.

There is no single solution for language teaching. Rather, several contextual factors need to be considered when thinking about multilingual education. Evidence shows that vocabulary size as a measure is language dependent. Thus, for each language that is taught, it is necessary to establish what the vocabulary threshold level is and to identify the most frequent words and/or morphemes that students should learn.

As the case studies and literature show, other factors also influence how successfully students learn a new language. The linguistic distance between the mother tongue of the students and the new language determines the ease and pace with which the new language can be learned. The greater the linguistic distance, the longer it takes to learn the new language. Also, the number of contact hours, the language level of the teachers, the use of the new language outside the classroom, and the perceived usefulness and value of the languages all play important roles in how quickly and effectively students can learn a new language. Young students learn at different speeds in different contexts. Therefore, the importance of each of these variables differs across contexts; different outcomes can be expected in terms of how long a student needs to be taught a language before it can become a MOI across settings.

Research suggests that it is not effective to teach a new language as a subject for a few years and then switch to that language as MOI without first establishing that students have reached a critical threshold level. Case study results have shown that the drop in learning outcomes is considerable otherwise. Unfortunately, no one method or approach will work for all contexts, so educators must be flexible and understand that different strategies available. Research has also shown that students can acquire the critical threshold level and learn a language well without it being used as a MOI in education.

In mixed language situations, it is important to understand the context (i.e., level is bilingualism, language distance) to target policy suggestions towards providing the most beneficial education for children. The use of an additional language as MOI cannot be expressed in years of education; the educational and linguistic context in which the additional language is learned needs to be considered.

RECOMMENDATIONS

Interest in multilingual education is high throughout the world. For example, the United Nations Economic, Scientific and Cultural Organization (UNESCO) is developing various initiatives to promote education in mother tongue and sponsored International Mother Language Day in February 2014.[3] There is a need for additional practical information and ideas that can be used for planning and structuring multilingual education programs.

Before starting a multilingual education program, it is essential to evaluate the approaches and determine which is best suited to learning an additional language and using that language as a MOI in the specific context. The issue is complex, but the factors that influence language learning have been identified and can be strategically addressed to benefit education, rather than hindering it; as is the case in many contexts. The recommendations for multilingual education presented in this report seek to contribute to the body of knowledge that can be adapted and implemented in different country contexts.

The following are recommended as preliminary guidelines for effective multilingual education:

Time

- Give young students time to learn to read in a language they know well.
- Give young students time to learn sufficient vocabulary in the new language, then have them learn to read in the new language, making use of their knowledge of reading in their first language.

Vocabulary and competencies

- Develop a competency-based scale that states what students need to be able to do (knowledge and skills) in the new language at different stages of their education.
- Determine the threshold level of vocabulary and competencies that enables students to benefit from education in each second or foreign language (e.g., English, French, Portuguese, Wolof, Kiswahili, Amharic, Hausa) to be used as a MOI in school.

Context

- Understand the context in which the new language is to be taught and consider this for planning when students are expected to be able to understand the new language as an MOI.
- At the national level, adopt a flexible policy that guides schools in choosing when to transition their students by adding the new language as MOI. Language tests based on competencies will be helpful in determining when young students are ready to transition.

Materials

- Ensure that the reading methodologies used for the mother tongue and the added language complement each other and take into account the linguistic variables of the languages used in the bi/multilingual education setting.
- Ensure that the language teaching methodology takes into the account the similarities and differences between the students' mother tongue and the added language(s), at least for the first few years.

3. For more information on UNESCO's work on multilingual education, visit http://www.unesco.org/new/en/education/themes/strengthening-education-systems/languages-in-education/multilingual-education/

Table 3. Factors that influence the pace of language acquisition

Factor	Reduced pace of acquisition/longer period of language learning	Faster pace of acquisition/shorter period of language learning
Time in a week	less than 3 periods a week	more than 3 periods a week
Vocabulary size necessary for threshold level (language dependent)	a larger vocabulary size is necessary for threshold level	a smaller vocabulary size is necessary for threshold level
Competences necessary to function at threshold level	the context makes it necessary for transition to take place at a higher grade	the context allows for transition to take place at a lower grade
Linguistic distance between the L1 and the additional language	linguistic distance is large; a longer period of language learning is necessary	linguistic distance is less or small; a shorter period of language learning is sufficient
Writing systems of the L1 and the additional language(s)	writing systems differ greatly (orthographic depth, syllable structure, etc.)	writing systems differ slightly (orthographic depth, syllable structure, etc.)
Script of the L1 and the additional language(s)	the scripts differ greatly	there is no or a small difference between the scripts
Language level of teacher that teaches the additional language	language level is below B2	language level is B2 or C1 or higher
The number of students in class	more than 15 students	less than 15 students
The interaction in the additional language classroom	few interactions results in a slower pace for language acquisition	many interactions increase the language acquisition pace
The starting age of the students	very young (between 4-10 years of age)	about 10+ years of age
The perceived value of the additional language	the perceived value of the additional language is low; it takes longer to learn it well	the perceived value of the additional language is high; enhancing acquisition pace
The additional language is a second or foreign language	when the additional language is foreign, language acquisition takes longer	when the additional language is a second language, pace of acquisition is enhanced

- For policy makers it is important to understand factors that influence the acquisition of an additional language. Policy makers can use this information to assess the potential success of an existing language policy and curriculum and adjust it so that success is enabled for all children who enter school. The table above summarizes the key factors discussed in this paper and how each influences language acquisition.
- There are many factors that influence language learning, and these factors affect each other as well. The context plays a role in the degree in to which these factors influence language acquisition. Therefore, it is important to conduct research and understand the context in which a policy and curriculum are being implemented.

For many additional languages, we do not yet know the most frequent words that should be taught. Also, a better understanding is needed of how differences between writing systems and scripts influence language acquisition in different contexts. Finally, more information is needed on what students acquire after each of education in different contexts, in terms of amount of vocabulary and different competencies. This would provide better guidance to policy makers on when students are ready to receive education through an additional language.

Based on evidence from the field, current language policies can be adapted to show respect for the linguistic backgrounds and heritages of people in different language groups. Evidence also can provide policymakers with clearer information on which sectors of the education systems in their country contexts need to be changed to ensure the best approach to language teaching.

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