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ABSTRACT

In Zambia the Ministry of General Education implemented two national literacy programs in order to improve low levels of reading; the Primary Reading Program (PRP) implemented from 1999 to 2014 and the Primary Literacy Program (PLP) piloted in some schools in 2014 before being scaled up. This research examines the acquisition of basic reading skills among learners in familiar languages at the end of grade 2 in the two national literacy programs. I examined assessment results separately for each program and compared the two with each other. Outcomes were observed on the basis of the Early Grade Reading assessment test battery given to random samples of children (n=393) in 40 schools from 4 districts implementing PRP, and random samples of children (n=1,593) in 160 schools from 12 districts implementing PLP. Results showed a high percentage of zero scorers in each of the programs. There are no significant differences between boys and girls for each program. Comparison of PRP with PLP, results showed a higher percentage of zero scorers for PRP than PLP. Comparison by each language, all results are in favour of PLP in Cinyanja only in letter-sound knowledge and non-word decoding and in Kiikaonde only in letter-sound knowledge. In Silozi results are in favour of PLP in all variables and in Icibemba in all variables except in reading comprehension. Comparisons by use of home language, in Cinyanja results showed significant differences in favour of PLP in letter-sound knowledge, non-word decoding and reading comprehension. In Icibemba significant differences occurred in orientation to print, letter-sound knowledge, oral passage reading and reading comprehension and in non-word decoding. In Kiikaonde and Silozi results showed significant differences in letter-sound knowledge. Comparison when home language was not the same as the language of instruction results in favour of PLP showed significant difference only in Silozi in listening comprehension. Comparisons by gender, results favour both boys and girls in PLP in all variables except in orientation to print where boys obtained significantly higher mean rank scores than girls (in the degree PLP resulted in better scores). Overall, this research revealed slightly better results for the PLP than PRP on the basic reading skills, more specifically in letter-sound knowledge and reading skills (non-word reading, oral passage reading and reading comprehension). The high peak of zero scorers for most measures is an indication that most children will not have learned to read and are thus in urgent need of better instructional support and further research is required in use of more efficient and effective interventions in Zambia.

Key words: reading skills, Zambia, Primary Reading Program (PRP), Primary Literacy Program (PLP), Early Grade Reading Assessment (EGRA), familiar language, transparent writing systems, letter-sound knowledge.

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TIIVISTELMÄ

Sambiassa opetetaan lukutaitoa nykyisin seitsemällä paikallisella kielellä, kun aiemmin englanti oli vuosikymmeniä opetuskielenä. Nykykäytäntö alkoi Primary Reading Program (PRP) -ohjeistuksesta (käytössä 1999–2014), jossa lukutaidon alkuopetus annettiin paikallisella kielellä. Siinä näkyy edelleen englannin kieleen suuntautuneiden opetusmenetelmien vaikutus. Oppimistulosten heikkouden vuoksi PRP uudistettiin 2013–2014 ja esitestattiin ennen kuin se Primary Literacy Program (PLP) -nimisenä hyväksyttiin valtakunnalliseen käyttöön vuoden 2014 lopulla. PLP on suunniteltu aiempaa paremmin sambialaisten kielten johdonmukaiseen (suomen kirjoituksen kaltaiseen) kirjoitusjärjestelmään sopivaksi. Tämän tutkimuksen aineisto kerättiin PLP-ohjelman ollessa esitestausvaiheessa. PRP- ja PLP-ohjeistusten seuraamuksia luku-taidon oppimisessa arvioitiin Early Grade Reading Assessment (EGRA) -testeillä neljällä sambialaisella kielellä toisen kouluvuoden lopulla. EGRA:n muuttujat ovat: orientaatio painettuun kirjoitukseen, kirjainten vastinäänteet, epäsanojen dekoodaus, sanojen tunnistus, suullinen tekstin lukeminen ja luetun ymmärtäminen. Havainto-aineisto perustui satunnaisotoksiin: 393 lapsen otokseen 40 koulusta neljältä alueelta, joilla käytettiin PRP:tä, ja 1593 lapsen otokseen 160 koulusta 12 alueelta, joilla käytettiin PLP:tä. Tulokset osoittivat, että suuri enemmistö oppijoista sai nolla-arvon lähes kaikissa mitatuissa lukemisen perustaidoissa, eikä tyttöjen ja poikien välillä ollut eroa. Tehtäessä kielikohtaisia vertailuja tulokset osoittivat PLP:n niukkaa paremmuutta äännevasteiden ja epäsanojen dekoodauksen osaamisessa cinyanjan kieltä lukemaan opettelevien keskuudessa. Ensin mainittu toistui kiikaonden oppijoilla. Silozin kielellä PLP antoi paremmat tulokset kaikissa EGRA-muuttujissa, icibemban kielellä muissa kuin luetun ymmärtämisessä. Erot opetusohjelmien oppimistuloksissa olivat pieniä. Verrattaessa PRP:n ja PLP:n paremmuutta sen mukaan, opeteltiinko lukemaan lapsen kotona puhumaa kieltä, havaittiin että PLP tuotti parempia tuloksia cinyanjaa opettelevien keskuudessa kirjainten äännevasteiden, epäsanojen dekoodauksen ja luetun ymmärtämisen muuttujissa. Kiikaondea ja silozia lukeville PLP antoi parempia tuloksia vain ensin mainitussa. Kun kotikieli ei ollut sama kuin lukemaan opettelun kieli, PLP:tä seuraavat saivat parempia tuloksia vain silozia lukevilla luetun ymmärtämisessä. Sekä tytöt että pojat saivat erikseen arvioituna hieman parempia tuloksia PLP-ohjelmalla. Kaikkiaan PLP:n osallistujien tulokset olivat PRP:n alaisuudessa opetettuja parempia äännevasteissa, epäsanojen dekoodauksessa, suullisessa tekstin lukemisessa ja luetun ymmärtämisessä. Olennaisin, vahva havainto oli kuitenkin, että nollatuloksen saaneiden osuus oli kohtuuttoman suuri kaikissa muuttujissa molemmissa ohjelmissa. Tehokkaampien lukutaidon opetusmenetelmien tarve on Sambiassa suuri. Kirjoitetun englannin kielen opetus alkaa Sambiassa 3. luokalla, eli heti tässä arvioidun lukutaitostatuksen jälkeen. Lukemisen perustaidot paikallisella kielellä vauhdittaisivat myöhempää oppimista englannin kieli mukaan lukien.

Avainsanat: lukutaito, Sambia, kansalliset opetusohjelmat (PLP, PRP), ala-asteen lukutaitoarvio (EGRA), johdonmukainen kirjoitusjärjestelmä, kirjainten äännevasteiden oppiminen.

ACKNOWLEDGEMENTS

FIGURES

TABLES

APPENDICES

CONTENTS

1   INTRODUCTION

Although Zambia has succeeded considerably in expanding its education system over the last couple of decades, improving quality, relevance and equity of education has been slow, despite the Government's efforts. The aim of education has been to improve both access to education and quality of learning. However, the improvements made in access to education demand for interventions that can uphold and improve the quality of education and provide universal opportunities for a defined minimum level of education, especially in literacy which is a tool for acquiring information and skills. The literacy levels in primary schools are very low and therefore the quality of learning is poor. In order to improve this situation, the Ministry of General Education introduced the Primary Reading Program (PRP) from 1999 to 2013. The program introduced use of initial literacy in Grade 1 in seven familiar languages for learning to read and write. The aim of PRP was to improve reading and writing skills among the pupils at the lower and middle basic levels in Zambian schools so that they can learn more effectively across the curriculum (Kanyika, 2002). In 2013, the Ministry of General Education revised the curriculum and introduced the Primary Literacy Program (PLP) that places emphasis on use of familiar language as the medium of instruction from grade 1 to 4 for literacy and for learning in other subjects.

In this research, I was therefore interested to know the levels of reading skills acquired by children by the end of Grade 2 in familiar language under both programs, PRP and PLP, to find out if they are ready for reading to learn in all subjects. I therefore compared the two programs by looking at the levels of reading skills acquired by end of Grade 2 in four languages, Cinyanja, Icibemba, Kiikaonde and Silozi. My objective was to compare the learning outcomes of two reading instructional methods in familiar language: the PRP that was based on a Language Experience Approach, and the PLP, that places much emphasize on a phonics-based approach and integrates key components for learning to read (phonemic awareness, phonics, fluency, vocabulary and comprehension).

1.1 Zambia's vision for literacy in education

Zambia is located in the Southern region of Africa and is divided into ten provinces; Eastern, Central, Copperbelt, Luapula, Lusaka, Muchinga, Northern, North Western, Southern and Western provinces The 752,614 square kilometer country in 2016 had a population of 15 million with a GPD per capita 27.0 billion USD and Gross domestic product of 2,682 billion. Close to 60% of the population lives below the poverty line and 42% are considered to be in extreme poverty. The Life expectancy is at 57.02 (World Bank, 2014). Figure 2 below shows the ten provinces of Zambia.
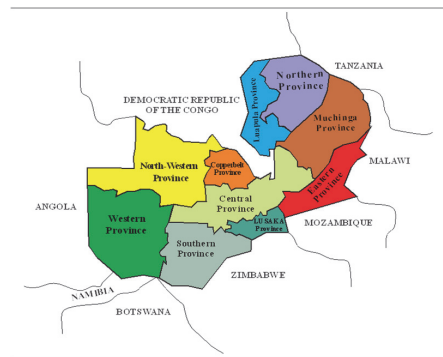
FIGURE 1   Provinces of Zambia. Retrieved from http//en.wikipedia.org – 2000

The national development plan is based on the theme "broad based worth and job creation through citizenry participation and technological advancement". The national goals based on this vision are explained by the Republic of Zambia (2006), Vision 2030, and Ministry of Finance and National Planning (2014) as: promoting inclusive growth, fostering a competitive and outward-oriented economy, reducing hunger and poverty and reaching middle income status. The nation's aspirations for education in Vision 2030 are expressed in section (g) to have strong and cohesive industrial linkages in the primary, secondary and tertiary sectors, (o) to provide access for all to good quality basic human necessities such as shelter, titled land, health and education facilities and clothing, and (p) to have diversified education curricula that are responsive to the knowledge, values, attitudes and practical skill needs of individuals and societies at large (Republic of Zambia, 2006). The economy of Zambia is dependent on little productive agriculture while mining of copper and coal are the bases of the economy.

Zambia's education vision is that, in order to have an innovative life-long education and training for all by 2030, literacy rates should be increased by 80% by 2015 and work towards eliminating illiteracy by 2030. In addition, NET enrolment rates should increase from 96% by 2010 to 99% by 2030 at basic school level (from Grade 1 to 9) while teacher ratio should improve to 40:1 at basic

school to 25:1 at high school by 2030. The pupil text book ratio should improve to 1:1 in all subjects by 2030 and to 1:3 in all subjects at high school by 2030. The average distance to basic schools should improve to 5 kilometer radius to 75% of potential learners by 2030 (Republic of Zambia, 2006).

From 1996 to 2013, structure of the education system in Zambia followed changes announced in 1996 that were aimed at ensuring that learners achieve essential skills, especially those that can support their livelihood if they dropped out of school at the end of each stage. In early grades, literacy and numeracy are pivotal to learners' social and economic support if they drop out of school. Therefore, there is a lot of effort by the Ministry of General Education to ensure that learners obtain quality reading in schools. From 1996, there were 9 years of basic education with Grades 1-4 considered lower basic, 5-7 middle basic and Grades 8-9 considered upper basic. Basic education was followed by 3 years of high school education. For historical reasons, most high schools continued to offer Grades 8 and 9. However, not all basic education schools offered the upper basic grades, resulting in limited places in grade 8. According to a study conducted by Ministry of Education (2007), system capacity for transition from middle to upper basic had been controlled through the Grade 7 completion of national examination.

When the Patriotic Front (PF) Government came into power, in 2013, changes were made in the structure of the education system. In line with the PF manifesto, the Government re-affirmed the provision of free education from grade 1 to 12, upgrading and taking over community schools, introduction of a two tier education system which provides for both an academic and a skills training career path, and a shift from having the first nine years of basic education and three years of high school education to the introduction of primary and secondary education and the annexing of ECCDE centers to existing primary schools. Therefore, from January 2013, the structure catered for ECCDE reception for children aged from 5 – 6 years, lower primary from grades 1 – 4, upper primary from Grades 5 – 7, junior secondary from grades 8 – 9, senior secondary from Grades 10 – 12 and tertiary education.

According to Ministry of Education, Science, Vocational Training and Early Education (MESVTEE) (2014), there were 5,420 primary schools and 2,896 community schools offering primary education from Grades 1 to 7 with a total enrollment of 3,075,161 (1,540,781 males; 1,534,380 females) learners in primary schools. Girls' enrollment was at 1,534,380, representing 49.9% while boys' enrollment was at 1,540,781, representing 50.1%. The national completion rate at Grade 7 was at 99.4% and 98% for both boys and girls. The Ministry of General Education recognizes the importance of offering Early Childhood, Care and Development (ECCDE) before children enter primary school. In 2012, of the 508,460 Grade 1 entrants, 94,976 (18.7%) had some form of Early Childhood Education. A total of 72,967 teachers were teaching in primary schools. The pupil-teacher ratio for the lower basic (Grades 1 – 4) stood at 48.2 in 2012 from 68.3 in 2011. At Grades 5 -7, it increased to 54 in 2012 from 37.2 in 2011. For Grades 8 – 9, pupil-teacher ratio went down to 25.4 in 2012 from 36.8 in 2011. The national

average pupil-book ratio stood at 10.99 in 2012. By improving access to education, Zambia has made great consideration for provision of equitable education to both boys and girls. When girls and women go into school, they do not only acquire fundamental literacy skills, but they are empowered to make key decisions and take charge of their lives through programs that focus on gender development (UNESCO, 2012).

In Zambia, the structures for education service delivery (technical and professional education support network) have been well defined from national to school levels with strong expert support teams with considerable capacity deployed at each level. These structures include the National Education Support Team (NEST), Provincial Education Support Teams (PEST), District Education Support Teams (DEST) and Zonal Education Support Teams (ZEST). At provincial, district and zonal levels, Teacher Resource Centers play a significant role in the organization of continuous professional development.

1.2 History of reading instruction in Zambia before and after independence

Although there are many basic literacy programs in Zambia, they cannot meet the need if ineffective language policies are implemented, methodologies for teaching reading are ineffective and teachers are poorly trained and insufficiently equipped with skills for teaching reading. The levels of reading have not been improving in familiar languages. One reason, in my view, could be the teachers' attitude towards use of familiar language that learned to read in the English language and used English as the medium of instruction for a long time. This has may have affected the teaching of transparent language that rely more on learning how letters form syllables and words as teachers end up teaching the letters of the English alphabet and teach with a lot of code-switching between English and familiar languages. In addition, literacy programs require a lot of support. Many individuals fail to learn to read as the result of environmental factors such as having no access to schools, inadequate instruction, and/or limited or no access to reading materials (Lyytinen & Richardson, 2014).

The history of education in Zambia started with the Missionaries in 1924. Before the colonial Government took over the territory, missionaries were responsible for education of indigenous people and a few selected languages had been used as media of instruction in a cluster of areas in a very few languages where churches or missions were established. Learning of reading was mostly based on evangelical teaching aimed at addressing the mechanical difficulties of reading and writing in the vernacular (Ohannessian & Kashoki, 1978). The method used to teach reading was syllabic where vowels /a/, /e/, /i/, /o/, /u/ were introduced and combined with consonants to form syllables and words. For example: /ba/, /be/, /bi/ /bo/, /bu/ and words *baba*, *bobe*, *bebe* (Ministry of General Education, Science, Vocational Training and Early Educa-

tion, 2013). According to Ohannessian & Kashoki (1978), many African children wanted to learn to read and enrolled into schools run by missionaries at that time. According to the Phelps-Stokes Report as observed in Ohannessian and Kashoki (1978), the increase in the number of children enrolled was perhaps the most spectacular change. During this period of time, there were 200, 000 native children scattered all over the protectorate in need of education facilities.

During the colonial period, from about 1930, mother tongue was used for five years up to standard 5 (now Grade 5) and English thereafter, was introduced when the mechanical difficulties of reading and writing in vernacular had been mastered. However, the teaching of familiar languages was unsatisfactory because of the complexity of language backgrounds of children, lack of trained teachers, lack of instructional materials and some methods in teaching (Ohannessian & Kashoki, 1978). At the beginning, only four familiar languages were introduced for learning (Bemba, Nyanja, Silozi and Tonga). According to the Ohannessian study, as mentioned in Ohannessian and Kashoki (1978), observers were asked to record the mother tongue of each teacher and the language that the teacher claimed to speak most fluently. Results showed that approximately 39% of the 254 teachers were teaching their mother tongue, 55% the language they spoke fluently, and 42% were teaching neither their mother tongue nor the language they spoke most fluently. Despite this challenge, the colonial vision was to advocate for use of mother tongue, or familiar languages as primary media of instruction and for the gradual introduction of the official/foreign language throughout the education system (Ouane & Glanz, 2011). This is an indication that, for a long time, Zambian teachers have done much of their teaching through the medium of another language that they are conversant with, usually English, that they were exposed to when they were in school and therefore comfortable with its use. Most of the teaching was based on rote learning through repetition, substitution, conversation question and answer. According to the Global Education and Monitoring Report (2016) teachers are rarely prepared for the reality of bilingual or multilingual classrooms. For example, in Senegal, where attempts are being made to use local languages in schools, training is provided only in French and a survey found that only 8% of the trainees expressed any confidence about teaching reading in local languages.

After gaining independence in 1965, Zambia introduced English as a medium of instruction in all schools and the training course for teachers was designed accordingly: The first course from 1965 to 1994 was the Zambia Primary Course (ZPC) that trained teachers for upper primary (U2), lower primary (L2) and Domestic Science. Students were trained in the following subjects: education, English, Zambian language, mathematics, religious education, industrial arts, physical education, science and home economics. The methods for teaching Zambian languages relied more on English teaching methods and the approach audio-lingua. The approach involved memorization of the letters of the alphabet, whole word and whole sentence teaching. This may have led to children memorizing stories without applying any reading skills.

From 1994 to 1999, the Zambia Basic Education Course (ZBEC) was introduced and students were trained to teach all grades at primary level by using English as a medium of instruction for all subjects except Zambian languages. Students took 8 subjects namely: education, English, Zambian language, mathematics, social studies, religious education, science and political education. From 1999 to 2012, the Zambia Teacher Education Course (ZATEC) was introduced. The course aimed to alleviate teacher shortage in basic schools. The program was designed for pre-service teachers to be in college learning for one year and go for teaching practice in the second year. The subjects were integrated and included 6 study areas: Education Studies (philosophy of education, sociology of education, special Education), Literacy and Languages of Education, Mathematics and Science Education (mathematics, science and agricultural science), Social, Spiritual and Moral Education, Home Economics and Industrial Arts (expressive arts with music, art and physical education). However, as the program was implemented, the Ministry of Education noted that the quality of skills acquired by students for teaching was compromised; one year was insufficient to prepare students for effective teaching in basic schools. Having teachers who do not receive intensive training may contribute to low levels of learning in schools. The Ministry therefore introduced a three year Diploma program that would improve the skills of teaching and raise the status of teachers in primary schools. It would be a motivation to phase out primary certificates and replace them with Diploma as the lowest qualification. Therefore, from January 2012, some colleges started to pilot a three year Preservice Primary Teachers' Diploma Course. All primary schools have now started implementing the three year Diploma course under the supervision of the University of Zambia. At the end of the three year course, successful candidates are awarded a Diploma in Primary Teaching by the colleges in conjunction with the University of Zambia. For teachers in primary schools who may want to advance their studies, the University of Zambia has introduced degree programs under the Directorate of Distance Education and a Masters of Education in Literacy and Numeracy and Applied Linguistics. The programs provide opportunity for serving teachers to obtain degrees but still remain teaching in primary schools. The seven familiar languages have continued to be taught as school subjects in regions of the country in primary schools.

The method of teaching under ZBEC and ZATEC focused on the Look-and-say method (whole word and whole sentence) for teaching English and Zambian language. In this approach, phonics was introduced in a simple way and reading for meaning. Learners were introduced to the skills of listening, speaking, reading and writing by chanting letters of the alphabet, syllables, and words and were drilled in reading stories (Williams, 1993). The method of teaching remained the same under ZBEC and ZATEC. The difference was that there were more activities for learners in ZATEC and the difference was more in the structure of implementing the course than the content, since under ZATEC teachers spent one year in college and one year in school for teaching practice as a way of alleviating the shortage of teachers. During the implemen-

tation of the Zambia Primary Course, Zambia Basic Education Course and the Zambia Teacher Education Course, English continued to be the medium of instruction from grade one to tertiary education. Evaluation reports revealed low levels of reading in schools. For example; the British Overseas Development Administration (IDA) commissioned a study conducted by the University of Reading that looked at the reading levels in a sample of Zambian schools in both English and selected Zambian language, Hinayana, at Grade 3, 4 and 6. The study indicated that on average, pupils could not read texts two levels below their own grade level (Williams, 1993). Another study, conducted in 1995 by South African Consortium for Monitoring Education Quality (SACMEQ), showed that only 25% of Grade 6 pupils could read at defined minimum levels (Linehan, 2005). In 1995, the Ministry of Education formed the National Reading Committee whose role was to follow up on issues related to reading and find ways to improve the challenges related to reading in Zambia (Linehan, 2005). The role of the National Reading Committee was to examine the reading problems and to propose actions. The National Reading Committee influenced the status of Zambian languages so that they were taught from grade 1 to 7 and results were considered for selection to Grade 8. The Ministry of General Education was concerned about the low levels of reading in primary schools and identified use of English from grade one as one of the factors contributing to children not being able to read. The Ministry of Education (1996: 39) in the National Educational Policy, Educating Our Future, acknowledges: "It is also a major contributing factor in fostering rote learning since from the outset the child has difficulties in associating the printed forms of words with their real, underlying meaning". The National Reading Committee continued to stress the importance of using familiar language when introducing basic reading skills and drew the Ministry's attention to the Education Policy about the language of instruction.

1.3 Gender: Opportunities for boys and girls in education

Zambia has made great efforts to ensure that both boys and girls are given an opportunity to learn by introducing the Free Education policy, introduced from 2002. This is to ensure that all children who reach the age of 7 can be in school and acquire the basic reading skills and life skills to develop into productive citizens. In the past, more boys were able to complete grade 12 than girls, but now there is gender parity, especially at grade one. However, as children progress from grade one to higher grades, more girls drop out of school than boys. According to the Ministry of Education (2010 the transition rate from primary to junior secondary was 53 percent for girls and 62 percent for boys, completion rate was 89.6% for girls and 90.9% for boys and the dropout rate for girls was 2.4 percent compared to 1.6 percent for boys for grades 1-7. In the same year, 2010, the transition rate from junior secondary to senior secondary was 44.8 percent for girls and 45.3 percent for boys, completion rate was 54.6 percent for

girls and 51.8 percent for boys and the dropout rate was 1.4 percent for girls compared to 0.5 percent for boys from Grade 10 to 12. According to the MES-VTEE (2012), the dropout rate for girls was at 2.71 percent compared to 1.88 per cent for boys. Zambia Daily Mail (April, 3, 2015) carried a story about one of Zambia's 73 districts, Solwezi, where pupil dropout rate was 2,246 in 2014 of whom 1,396 were girls and 846 were boys. In rural areas, more girls drop out of school than boys because of early marriages, long distances to schools and demand for them by families to perform house chores. However, there are many campaigns to educate people about the importance of girls' education. This is because investment in a girl benefits the whole society. Learning to read can be a tool for providing boys and girls with information on how they can protect themselves from exposure to different forms of vulnerability. Offorma (2009) observes that, without education, girls are denied the opportunity to develop their potential and to play a productive and equal role in their families, their societies, their country and their world.

According to World Bank (2010), education is the most powerful instrument that can help to reduce poverty and inequalities between boys and girls and lays a foundation for sustained economic growth. Although progress has been made to ensure provision of access and quality of education to both boys and girls, more effort is required to ensure that girls who enter primary schools are retained so that they receive their basic education that can improve their livelihood. Literacy can improve the lives of both boys and girls. Once they are able to read and write they can acquire more knowledge to safe guard and improve their lives and their families.

This research compares how the two programs have benefited both boys and girls by the end of Grade 2 in familiar language so that if gaps are identified, measures could be taken to improve the situation in the currently introduced program, Primary Literacy Program. The findings of this research will be shared with the Ministry of General Education so that if there are gaps, improvements could be strengthened in methods for reading instruction.

1.4   Languages used for reading instruction in Zambia

Zambia has 73 languages that can be deemed dialects because they belong to the Bantu family and are closely related in terms of orthography. The indigenous languages all belong to the Bantu taxonomic group within which varieties share a strong core of grammatical and lexical commonalities and the borders between them are porous (Serpell, 2014). Most of these languages have been in existence for a long time before the 18th century. Because of 73 dialects, in Zambia it has not been possible to provide education in all languages that children speak. Therefore, only seven languages are used as lingua francaes in the ten regions of Zambia and are used for learning purposes. Icibemba is widely spoken in the Copperbelt, Northern, Luapula, Muchinga and Central provinces. The ten provinces are subdivided into districts. In total, there are currently 86

districts. Cinyanja is widely spoken in the Eastern and Lusaka provinces. Silozi is spoken in the Western province, Chitonga in the Southern province and Kiikaonde, Luvale and Lunda are spoken in the North Western province. According to Ministry of Finance (2012), Zambia's most widely spoken language is Icibemba, spoken by 33.5 percent of the population as either a first or second language. Cinyanja is spoken by 14.8% of the population, Chitonga by 11.4% and Silozi by 11% of the population. Kiikaonde, Lunda and Luvale are spoken by fewer people in comparison to the other four. The seven languages are classified as familiar languages because they are widely spoken by many people in the ten provinces and used for radio broadcasting or other forms of communication. According to Sampa (2005), the seven Zambian languages selected for learning to read and write are lingua francaes in areas where they are spoken and are therefore considered as the language of play, which are familiar to the children. Therefore, when selecting the seven familiar languages, it is not the language spoken at home (since this varies from home to home), but the most common language spoken by the majority of children at school. According to Ouane and Glanz (2011), a familiar language is used for a situation whereby a large number of languages co-exist in an environment of the child and it is unlikely that each child would be able to receive mother tongue education and therefore likely possible that education could be made available in a language of the immediate or local community with which the child is familiar. Figure 1 below shows regions in which the seven languages are used in schools as familiar languages.

FIGURE 2   Zambian regions for seven familiar languages

The seven familiar languages have influenced the development of language policies which have been aimed at achieving quality education. Since Zambia was colonized by the British at independence in 1964, English was adopted as the national official language. English is widely used as a second language and as the first language for about 2% of the Zambian population. Apart from being used as a medium of instruction, English is used for official communication, administration and national functions. English language has spread as a lingual

francae because of its dominant position in the school system, its use in public administration, its use as a requirement in most cases for obtaining employment and consequently, its high status in society (Ohannessian & Kashoki, (1978).

Use of familiar languages is important in education and for early grade reading, especially if they cater as home languages for children. However, although National education policies should recognize the importance of teaching children in their home language, in multilingual countries like Zambia with 73 languages, it has been difficult to choose the language of instruction to suit the needs of all learners, apart from the seven familiar languages. A review of 40 countries' education plans found that less than half of them recognize the importance of teaching children in their home language, particularly in early grades (Global Education and Monitoring Report, 2016). As a result, children who speak other languages not taught in the classroom often enter school with low esteem and learning needs that teachers may feel unable to meet (Global Education Monitoring report, 2016: 5). However, in multilingual countries like Zambia, the challenge has been how to select the language of instruction to suit the needs of all learners.

1.5 The writing systems of the Zambian languages

According to Aro (2004), there are variations in the rate of reading acquisition among different orthographies and this variation is related to so called orthographic depth (transparency, regularity, consistency) of languages. Zambian languages are classified as transparent languages that have a shallow orthography. Zambian languages have grapheme-phoneme correspondences that are simple and straightforward. Therefore, the ability to build word pronunciation on the basis of grapheme-phoneme correspondences is sufficient for accurate word recognition (Aro, 2004). The structure has five vowels *a, e, i, o, u*. According to Ohannessian & Kashoki (1978), the similarity of languages is described as having the same sounds and combination of sounds or clusters (phonological similarity), in the way they are structured or words are arranged in sentences or expressed to give special meaning (grammatical resemblance), or in the proportion of words that they have in common (vocabulary correspondences). The syllable structure for Zambian languages is V, CV, CCV, CCCV (e.g. *a*, *na*, *mba*, *mpwe*) and in many languages, consonants j and g do not occur (Ohannessian & Kashoki, 1978). For Zambian languages, consonant clusters differ in many respects from those found in English. For example, while English permits such consonants as *pl* as in play, *ps* as in cups, *mps* as in stamps, *spr* as in spray and *sks* as in flasks, these would not be possible in Zambian languages without a vowel being inserted in between the consonants (Ohannessian & Kashoki, 1978). The other difference between English and Zambian languages is that, while Zambian languages are tonal languages, English uses stress to distinguish one word or phrase from another in meaning. The structure of phonemic awareness

develops more rapidly in children who are learning to read transparent alphabetic orthographies because it is accurately guided by the letters (or graphemes) whose sounds they learn if instruction focuses – as it should - on those of the letters (or graphemes of more than one letter) each of which represents only one of the phonemes of a transparently written language (Lyytinen et al., 2015). Goldenberg, et al. (2014) observe that, in addition to learning the letter-sounds, children learn how to read by knowing how letters combine (blend) to form syllables and words and move towards a communicative and functional approach for learning to read.

Zambian languages are written in a transparent way and it is natural that children can learn to decode words faster than children who are learning to read less consistent orthographies. In deep orthographies, like English, grapheme-phoneme correspondences are complex and irregular, and the beginning reader has to supplement (and replace) grapheme-phoneme conversion strategies with recognition of units such as rimes and whole words (Ziegler et al., 2003).

1.6   The importance of using familiar language when introducing basic reading skills

The use of English as medium of instruction in early grades disadvantaged many children and contributed to low levels of reading in schools. As noted by Linehan (2005) in his paper for UNESCO, teaching and learning in an alien language had meant that, for the vast majority, school was unrelated to life because rote learning was the only way to approach a situation where understanding was absent from home, with mindless repetitions replacing problem solving and inventiveness. According to Kaani & Joshi (2013), English is considered one of the most orthographically opaque among alphabetic languages, thereby posing the most difficult to master while Finnish is considered the most transparent among alphabetic languages. Lyytinen, et al. (2015) has observed that, from previous studies conducted in Finland, children begin their first year of school in August when they are 7 years old and by then, 45% can read a given text and most of them know the letter names in Finnish. The literacy programs in Zambia promote initial literacy in familiar languages that are transparent and have consistent letter-sounds, similar to the Finnish language. Children can learn quickly how to blend the consistent sounds into syllables and form words. Therefore, since Zambian children use transparent languages to learn to read, then given the right instruction methods, children in early grades can be able to read earlier than before.

The Ministry of General Education was long aware that language in education policies can be a source of education quality. As noted by Ministry of Education (1996) in the National Education Policy, Educating Our Future, there is strong evidence that children learn literacy skills more easily and more suc-

cessfully through their mother tongue, and subsequently, they are able to transfer these skills more efficiently to English or another language. Lyytinen et al. (2014) noted that, like many other African Bantu languages, Zambian languages have transparent and consistent orthographies at the grapheme-phoneme level similar to the Finnish language. Letters in Zambian language represent sounds consistently and this makes it easier to learn to read than if they were instructed to read in English (Abadzi, 2013). This means that, when a country like Zambia is choosing a language for reading instruction, the basis is not only that a familiar language supports cultural identity, but also the linguistic factor is considered so that children are able to read earlier than before. While it has long been understood that use of mother tongue is important for preserving cultures and is a fundamental human right (EFA Global Monitoring Report, 2006), it is less known that there are differences between writing systems also among those of alphabetic orthographies in regards to how easy or difficult they are to learn to read.

There are other social factors that may influence selection of a language of instruction. For example, there are similarities and differences between boys and girls as they relate to learning process, bias free teaching practices, curricular and instructional learning materials are still far from reality (UNESCO, 2012). Zambia has improved in terms of provision of access and quality education to both boys and girls so that they can become literate, especially in the languages that they speak and gain knowledge to improve their lives and their families.

According to Serpell & Simatende (2016), an additional policy of offering initial literacy instruction in the indigenous African languages is that they all have a transparent writing system (orthography) most of which is shared across all the Zambian languages. According to Serpell & Simatende (2016) *A, E, I, O,* and *U* each consistently represents a single phoneme in each of the Bantu languages of Zambia and this makes initial literacy learning much easier than it is in English whereby each of these letters represent different phonemes.

The Global Education and Monitoring Report (2016) advises that consideration should be made to teach children in a language that is familiar to them but according to the study conducted, as many as 40% of the global population of children do not have access to education in a language they speak or understand. The report further stresses that using home language as the language of instruction ensures children acquire strong foundation skills in literacy and numeracy because mother tongue based bilingual (or multilingual) education approaches in which a child's mother tongue is taught alongside the instruction of a second language, can improve performance in the second language, as well as in other subjects. According to the Global Education and Monitoring Report (2016), to be taught in a language other than one's own hinders early acquisition of critical reading and writing skills. The reason cited by the Global Education and Monitoring Report (2016:2) is that parents of these children lack literacy skills or familiarity with official languages used in school, which can create gaps in learning opportunities between minority and majority language groups.

Since Zambia gained independence in 1964, the focus in education has been to improve the quality of education. This is because literacy is important for learning in schools. When children are able to read fluently and write clearly, they are able to gain knowledge from other materials in other subjects. According to the Global Education and Monitoring Report (2016) literacy skills are best developed in childhood through good quality education and they are sustained by continual practice in literate environments at work or in the community and through adult and continuing education.

According to Lyytinen et al. (2015), learning letter-names is the first step for learning to read because once learners are able to build connections between the sounds of single phonemes and their representative letters/graphemes they are then able to form syllables, words and read them in context with meaning. From learning in familiar languages, children can be introduced to oral language in the second language such as English, which is the starting point for learning any language.

In orthographies such as in those of African languages, the consistent way of matching phonemes and their corresponding graphemes means that such a number is about 30. In contrast, in English, none of the single letters is sounded out in the same way in all contexts of written English where only larger units (of >1 letters) start to have more consistent connections. From reading the letter-sounds, syllables and words, learners require practice through exposure to reading materials so that rapid and automatic decoding and recognition of words can develop. In order to ensure that children continue to develop reading skills, it is important that correct instruction methods are used for teaching reading and schools are supplied with a variety of adequate reading materials. By reading, children will develop sight words that will strengthen their reading skills and build their vocabulary. Through constant reading, the children will also develop reading fluency. Therefore, learning to read a transparent language requires acquisition of the letter-sounds and knowing how to put these sounds together in order to decode words.

Learning basic reading skills in languages with transparent orthographies is very quick but requires that learners are motivated and able to move their attention from the initial focus on small units as quickly as possible to larger units, preferably to the identification of whole words (Aro, 2004). Nonetheless, reading fluency in familiar language would facilitate substantially the learning of more complicated orthographies such as English, French and Portuguese (Abadzi, 2013) which have continued to be used as official languages in many countries in Africa after the colonial period.

The experience for Zambia is that children have not performed well in reading in the first four years of their education and therefore efforts have been made to find appropriate methods for teaching reading. This may be due to failure to detect performance of children through assessments from as early as they enter school. The National Assessment only focused on assessing learners at grade 5 when it may be too late to address the reading problems. According to the Global Education Monitoring Report (2016), diagnostic and formative

assessment tools are crucial to improve the quality of education and make it more equitable and such assessments are helpful in diagnosing learning difficulties, especially among low achievers. Therefore, it is important that any program implemented should be able to ensure that learners begin to read as early as possible when they enter school so that, as they move from grade to grade, they develop reading skills by being exposed to adequate, appropriate and interesting materials to read. This will help them to read in other subjects. It is therefore important to track the performance of children's reading as early as possible so that interventions can be put in place to improve the situation, if children are not able to read.

2 PROGRAMS IMPLEMENTED TO SUPPORT READING ACQUISITION IN ZAMBIA

2.1 Primary Reading Program (PRP) implemented from 1999 to 2013

It is observed by the Ministry of Education (1996: 39) that "For over 30 years from 1965 children who had very little contact with English outside school were required to learn concepts through English medium, this was an unsatisfactory experience". The Ministry of Education further states, "The fact that initial reading skills are taught in and through a language that is unfamiliar to the majority of the children is believed to be a major contributory factor to the backwardness in reading shown by many Zambian children. It is also a major factor in fostering rote learning, since from the onset the child has difficulties in associating the printed forms of words in their real, underlying meaning." It was observed that Grade 1 to 4 failed to exhibit expected reading, writing and numeracy skills (Ministry of Education, 1996). Familiarity of the language of instruction, and its effect on learning to read has raised concern in Zambia (e.g. Kaani & Joshi, 2013; Matafwali & Bus, 2013).Therefore, based on the Basic Education Quality and Curriculum Policy that "Officially English will be used as the language of instruction, but the language used for initial literacy learning in Grade 1 – 4 will be one that seems best suited to promote meaningful learning by children"(Ministry of Education, 1996: 45), the Primary Reading Program (PRP) was officially introduced from 1999 to 2013. The aim of the program was to improve reading and writing skills among the pupils at the lower and middle basic levels in Zambian schools. Initial literacy in familiar language was introduced in grade 1 using seven familiar languages and in Grade 2, learners were introduced to reading instruction in English and continued to learn to read in Grade 2 in familiar language during Zambian language lessons.

The Ministry of Education (2000) was designed to give priority to the teaching of literacy. In the curriculum, there was a separation of literacy teaching and language teaching. Literacy emphasized the teaching of reading and

writing skills while language teaching emphasized skills such as grammar and syntax (oral, lexical, and structural elements of the language). These were taught and timetabled separately in schools as literacy in familiar language and Zambian language. The design of the PRP program was that 5 hours per week was allocated for learners to learn to read and write by following the New Breakthrough To Literacy (NBTL) course, one and half hours per week for the oral English course (Pathway 1). In Grade 2, 5 hours per week was allocated for learning to read and write in English by following a course called Step In To English (SITE), 1 hour per week for Zambian language and 30 minutes per week for oral English (Pathway 2). In total, 13 hours per week was allocated for literacy and language teaching from Grade 1 to 2. English language remained the medium of instruction from grade 1 to tertiary education. In Grade 1, the NBTL course based on Language Experience Approach was used to develop children's reading skills by using the language that learners acquired prior to entering school in Grade 1.

According to Ministry of Education (2001) in the Teacher's Book for New Breakthrough To Literacy, the approach for teaching reading in Grade 1 started with what learners know in their spoken language and used this to learn something new. This was linked to the sets of the core vocabulary that had been identified for each language. In this approach, first the teachers used briefly a phonic flip chart to teach letter-sounds which were used to form syllables and words. The process of teaching the sound of the day was: The teacher showed a picture to the pupils, the pupils identified what was in the picture, e.g. *mayo*. The teacher showed the word *mayo* with *m* high-lighted in the word. Learners practiced the *m* sound. They then formed words from *m*. E.g. *mama, mona, etc…* The introduction of the letter-sound was done very briefly for about 5–10 minutes, without much practice of blending to form syllables and words. Then the teacher asked learners to elicit the key sentence from the sentence poster that contained the word *mayo*. The sentence was written on the board with the word *mayo* underlined. Learners were asked for other words that contained the letter-sound *m* that were made earlier when they used the phonic flip chart. The learners then were asked to construct sentences based on those words, to make sentences on sentence makers and write them first on the board and then copy them in exercise books for later reading at home. This was good because it gave learners the opportunity to obtain the meaning of what they were reading or writing, based on their experiences.

This type of instruction continued for twenty-six weeks or two terms with phonics introduced for only 5 to 10 minutes at the beginning of each lesson. In the early stage, learners were only drawing a picture about the sentence elicited from the conversation poster. In this approach, the look-and-say approach was also used where learners were allowed to recognize words by the use of flash cards. Learners were also exposed to real books called "Rainbow Readers" and other readers that they read with teachers, peers, and parents at home. Through this method learners were expected to become fluent readers in a familiar language by end of Grade 1, and continue to read in Zambian language in Grade 2.

The program demanded a lot of innovation and creativity among teachers. 'Talking' walls were covered with work written by children and teachers and the written work was used for remedial teaching. Tracking of learner performance was done through continuous assessments conducted by teachers at the end of each of the six sets of the core vocabulary.

Sampa (2005) observes that the Primary Reading Program was a success story and an example of an initiative that placed great importance on achieving access and quality learning in basic schools. The success of the program was attributed to using an appropriate language policy that promotes the use of local language, allowing children to read initially in their local familiar language; followed by the transfer of the reading skills acquired in the familiar language to the English language. This approach has proved to be an appropriate way for child-centered interactive experiential learning and moves learners from known to the unknown. According to the evaluation report (Kanyika, 2002), the program gave promising results, as shown in Table 1.

TABLE 1   Mean performance in Zambian languages (ZL) by grade (1999 and 2002)

	ZL Reading		ZL Dictation		ZL Free Writing		ZL Total	ZL Total
	1999	2002	1999	2002	1999	2002	1999	2002
Grade 1	0.8	8.1	0.8	6.2	0.5	1.7	2.1	16.4
Grade 2	2.6	18.9	2.5	15.1	0.5	2.6	5.7	35.0
Grade 3	5.7	33.8	4.8	18.8	1.0	2.8	11.4	55.2
Grade 4	12.3	45.9	8.6	25.3	2.2	6.4	23.2	77.1
Grade 5	22.2	51.0	14.8	28.8	4.1	9.3	40.8	89.1

Kanyika (2002) described the performance, in Grade 1 to have been eight times better in 2002 than it was in 1999, six times better in Grade 2, five times better in Grade 3, three times better in grade 4 and two times better in grade 5..

However, the program faced some problems. Examples of some of these challenges, in my view, may have related to inadequacies of the teachers in the target familiar language. For some, it was not their mother tongue or familiar language, code switching and code mixing of language by both teachers and pupils exposed to English language. Learning English letters of the alphabet to learn to read familiar language did not help learners to form correct syllables and words. Another assumption is that teachers may have been inadequately prepared for bilingual teaching based on a communicative and functional approach for children to grasp the meaning. The PRP teaching materials were worn out and difficult to improvise (Banda et al., 2012). The Ministry of Education could not replace materials because the materials were very expensive and the Ministry had financial constraints to buy replacement kits.

According to the National Assessment conducted by the Ministry of Education among grade 5 learners, in 2003, only 31.1% of pupils out of the total

number of children who were introduced to PRP had achieved the expected performance level in Zambian familiar languages. In Zambia, according to Ministry of General education, the expected minimum level is 40%. Less than 40% is considered to be below minimum. In 2012, with full implementation of the Primary Reading Program, the percentages of acceptable reading performance levels had increased only slightly to 36.8% in Zambian local familiar languages. The South African Consortium for Monitoring Education Quality (SACMEQ III, 2010) indicated that, among grade 6 learners that were tested in reading in Zambia, only 27.4% were able to read at a basic competency level. The USAID Read To Success Project (2013: 18), the Baseline Survey Report indicates that out of 2,024 Grade 2 learners that were assessed in oral passage reading, only 11% were able to read some words. Because of these continued low results, the Ministry of General Education decided to review the Primary Reading Program whose results were not promising and replaced it with the Primary Literacy Program in 2014.

2.2 Primary Literacy Program (PLP) implemented from 2014

From 2012 to 2013, the Ministry of General Education revised the curriculum and explored new approaches for teaching reading implemented in the Primary Literacy Program (PLP). Learning from other countries, a new approach based on teaching the five key skills of learning to read (i.e. phonic awareness, phonics, vocabulary, fluency and comprehension) was identified. With support from the Read To Succeed project (RTS), the National Literacy Framework to guide the implementation of literacy programs in Zambia was developed, and a cost effective approach for teaching reading based on teaching letter-sounds in grade 1 and developing the key skills from Grade 2 to 4 in familiar language was developed. The Ministry of Education, Science, Vocational Training and Early Education (2013) in the National Literacy Framework notes that scholars in reading acquisition in multiple languages (e.g. Abadzi, 2006; Chiappe et al., 2002; Linan-Thompson & Vaughn, 2007; Sprenger-Charolles, 2004) have found that learning to decode print---that is, breaking apart or "sounding out" written words into letter sounds---can be done in almost any alphabetic language and requires five key skills, which have been endorsed by the US National Reading Panel in 2000. Therefore, beginning 2014, the Ministry of General Education decided to use the approach that synthesizes reading instruction based on explicit lessons in key competency areas; direct instruction of letter sounds, formation of words and syllables and daily instruction that offers learners the opportunity to practice listening, speaking, reading and writing in local language (Ministry of Education, Science, Vocational Training and Early Education, 2013).

In PLP, the Grade 1 literacy course is guided by the phonics-based approach (as it is known) that emphasizes beginning teaching of letter-sounds in familiar language, blending sounds into syllables and forming words. The methodology involves introducing letter-sounds scoped and sequenced from

simple to complex in each familiar language. Learners begin to learn the five vowels: *a, e, i, o, u*. Then they blend with consonants to form syllables, e. g. *ba, be, bi, bo, bu*. By changing the order, learners practice to read the syllables. Using syllables, learners begin to form as many words as possible. E.g. *aba, bobe, babi, etc...* Then they begin to form sentences that contain syllables they have learnt. This process is followed by introducing another consonant or cluster of consonants, and learners begin to construct words and build on the previously learned consonant(s). E.g. *ma, me, mi, mo mu; bamo, beme, moba*, etc… Then again, they construct sentences. The sentences help learners to grasp the meaning of the words they are learning, which they encounter every day as they speak. The process goes on until they exhaust all letter-sounds scoped and sequenced in their language. This normally takes two terms or twenty-six weeks. In most cases, when they exhaust letter-sounds, they practice reading and writing short sentences and short stories by third term for thirteen weeks. When learners move into Grade 2, they are exposed to more texts in local language and begin to develop their writing skills by writing short paragraphs on themes that are familiar to them. The medium of instruction for learning all subjects from grade 1 to 4 is familiar language.

Based on the fact that learners read much faster if they are exposed to text to improve fluency and comprehension skills, the Ministry of General Education was inspired by the Reading Support for Zambian Children (RESUZ) pilot that was conducted in Lusaka in Cinyanja with use of Graphogame initiated by the University of Zambia in collaboration with University of Jyväskylä of Finland. The project that started in 2010 supports the Ministry of General Education through research to establish the use of effective technology to improve learner performance in early grade reading. Lyytinen and Richardson (2014) define Graphogame as a game that emanates from a Finnish-language game called Ekapeli designed to address reading difficulties such as decoding skills (letter-sound knowledge, skill to sound out letter sequences), word identification and provides sufficient fluency and comprehension skills for a reader to recall the beginning of the sentence and the interpretation of the sentence. According to Lyytinen and Richardson (2014) Graphogame also improves teachers' reading skills when a favourable condition for integrating training and assessment is provided. Graphogame was implemented as an additional tool for learning to read in Cinyanja by learners in Grade 1 in some schools in Lusaka in 2011 under Reading Support for Zambian Children (Folotiya, et al., 2014). During the pilot, Graphogame helped learners to proceed from easy to difficult and small to larger units, from letter sounds to written and spoken syllables and words in transparent Cinyanja. As a result, low performing learners reach the level of high performing peers. Grade 1 learners were exposed to letter-sound knowledge in Cinyanja by use of Graphogame that was installed on Samsung cell phones. A group of learners played the Graphogame out of lesson time within school as an additional activity. The mean exposure time of playing the Graphogame was 94 minutes which was also the median time. The play time varied between 7 and 9 minutes, separated by rest intervals of 1 to 10 minutes.

Children played Graphogame in the classroom situation in small groups under monitored conditions. Results showed a positive effect of the game for the spelling test.

Consequently, Graphogame has proved to be a good approach for teaching reading and the game helps children to identify letter-sounds, form syllables and words and short sentences. It exemplifies that teachers of early grades and learners can be supported to produce good reading skills. In Zambia, from January 2014, all learners from pre-school to grade 4 are instructed to read following PLP phonics-based approach in 7 familiar languages: Icibemba, Cinyanja, Chitonga, Silozi, Kiikaonde, Lunda and Luvale. In terms of curriculum design, there is now a substantially longer time of two years for PLP compared to the one year duration afforded earlier for PRP by end of Grade 2. The PLP was piloted by Read To Succeed from 2013, and implemented in all schools, starting with grade 1 only in 2014. The Ministry of Education in 2013 made it public that the revised curriculum would be implemented in 2014, would use familiar languages as languages of instruction, as well as languages for teaching initial literacy from pre-school to grade 4. He further stated that English would continue to be used as language of instruction from grade 5 to tertiary level.

The goal for PLP is to support early literacy in familiar languages for learners from grade 1 to 2. From Grade 1 – 4 local familiar languages are used for learning to read, as well as for general learning in other subjects (MOE, 2013). According to Ministry of Education (2013) in the Zambia Revised curriculum, three and a half hours have been allocated for pre-literacy skills and language for ECCDE, and six and half hours have been allocated to teaching of literacy and language from grade 1 – 4. This means that, under PLP, the Ministry of General Education has maintained the separation of literacy teaching from language teaching so as to give priority to the teaching of literacy, just as was the case in PRP. Now, in PLP in grade one, 5 hours per week have been allocated for children to learn to read and write in familiar language and learners have an additional one and half hours per week for Zambian language where they learn skills like grammar, syntax and comprehension. In Grade 2, again 5 hours per week have been allocated for children to continue to learn to read and write in familiar language, 1 hour per week for oral English and 30 minutes per week for Zambian language. From Grade 3 and 4, learners are introduced to reading and writing in both familiar language and English language. The other strength is that, under the Primary Literacy Program, the medium of instruction from Grade 1 to 4 is the familiar language. From Grade 5 to 7, Zambian language and English are taught as subjects and English language is used as medium of instruction for all other subjects. The additional one year for teaching familiar language from grade 1 to 2 will consolidate reading skills in familiar languages.

Table 2 shows the time allocated per week for literacy and language and other subjects as indicated in the Zambia Education Curriculum Framework (Ministry of Education, Science, Vocational Training and Early Education, 2013).

TABLE 2   Grades 1 to 4 time allocated per week in different subjects

Subjects	Time	Periods
Literacy and language	6hrs. 30mins	13
Mathematics	5hrs.	10
Social sciences	2hrs. 30mins.	5
Integrated science	2hrs. 30mins	5
Creative and technology studies	4hrs.	9

The teachers instructing learners to read for both PRP and PLP used English to learn to read when they were in school and at college, they were also trained in English language. During the training for PRP and PLP again, English language was used and most of the materials were written in English and only activities were in local languages. Both the PRP and PLP teachers are trained through in-service training at district and zone levels. Most teachers accepted the policy of teaching reading in familiar language because they were more comfortable to teach in local language than in English language. After training, they continued to practice through school-based Teacher Group Meetings (TGMs).

The PLP is implemented in phases and in 2013, only schools that were supported by Read To Succeed Project implemented PLP (12 districts and 160 schools in this study). It is only from 2014 that the Ministry of General Education rolled out PLP to all primary schools starting with Grade 1. This means that those Grade 2 learners in 2014 in 4 districts and 40 schools in this study were still following PRP.

The development of the two programs, PRP and PLP, has been based on the Ministry of Education (2000: 13), Basic School Curriculum Framework, which was designed to give priority to the teaching of literacy. In the curriculum, there was a separation of *literacy* teaching from *language* teaching. This was done with the understanding that literacy emphasizes the teaching of reading and writing skills while language teaching emphasizes skills such as grammar and syntax (oral, lexical, and structural elements of the language). These are taught and timetabled separately in schools as literacy in familiar language and Zambian language. Both PRP and PLP have purported to enable children to become functionally literate in 2 years when a familiar transparently written language is used to learn to read. Table 3 shows the times for literacy and language allocated per week for PRP and PLP, based on the National Literacy Framework (Ministry of Education, Science, Vocational Training and Early Ed-ucation, 2013).

TABLE 3   Allocation of time for literacy and language for PRP and PLP – Grades 1 and 2

	Grade 1			Grade 2			
			Total				Total
PRP	Literacy in familiar language (NBTL) 5hrs	Oral English (Pathway 1) 1hr. 30mins	6hrs. 30 mins	Literacy in English (SITE) 5hrs	Zambian language lessons 1hr	Oral English (Pathway 2) 30 mins	6hrs. 30 mins
PLP	Literacy in familiar language 5hrs	Zambian language lessons 1hr. 30mins	6hrs. 30 mins	Literacy in familiar language 5hrs		Oral English 1hr. 30mins	6hrs. 30 mins

Familiar language/Zambian Language = Icibemba, Cinyanja, Chitonga, Silozi, Kiikaonde, Lunda & Luvale

3   ASSESSMENT OF THE BASIC READING SKILLS: EARLY GRADE READING ASSESSMENT (EGRA) TESTS

The Research Triangular Institute (RTI) International supported the Ministry of General Education to develop Early Grade Reading Assessment (EGRA) tests in the Icibemba language in 2011 but the tool did not yet exist in other languages included in this study, Cinyanja, Silozi and Kiikaonde. Other literacy tests had been created before EGRA e.g. BASAT (Ketonen & Mulenga, 2003) and ZAT (Yale University & University of Zambia), but different tests have different purposes. EGRA was developed to measure the reading skills of a relatively large number of learners quickly to estimate the grade level appropriate reading skill at school or class level.

EGRA is an individually administered oral assessment of the most basic foundation skills for literacy acquisition in early grades. It is used as a diagnostic tool to measure student progress in reading (Sorensen, 2015). As an international assessment tool, EGRA was developed by USAID through its Education Data for Decision Making (EdDataII) in collaboration with Research Triangle Institute (RTI) International in 2006, based on the five pillars of reading proposed in 2000 by the National Reading Panel. These are: phonemic awareness (the ability to identify individual sounds in spoken words), phonics (the correspondence of letters (graphemes) to sounds (phonemes), fluency (the ability to read text accurately and quickly with natural prosody), vocabulary and comprehension (the ability to understand and communicate meaning from what is read) (Sorensen, 2015). EGRA was also influenced by Dynamic Indicators of Basic Early Literacy Skills (DIBELS), a continuous classroom tool developed for use in the US (retrieved from: www.educationincrisis.net, 2015). It has been used in over 60 countries, including Zambia.

In Zambia, out of the seven familiar languages, EGRA was first adapted in 2011 in one language, Icibemba. The creation of the letter frequency list, non - words, reading and listening comprehension passages were taken from the Ministry of Education Icibemba curriculum. According to Research Triangle

Institute (RTI) (2012), the instrument designed for Zambia in 2011 initially assessed the following five components: *Letter-sound knowledge*: Learners were assessed in reading skill of letter-sound relationships required for sounding out new words. The test contained 10 rows and 10 random letters and learners were asked to sound out as many letters as they could in one minute. *Unfamiliar word oral reading fluency*: Children were assessed in how they applied their reading skill in letter-sound correspondence rules to decode new words. It consisted 50 made up words and learners were asked to sound out as many words as they could in one minute. *Connected text oral reading fluency*: learners were assessed in how they read the passages fluently. In this earlier design of EGRA during the first pilot in 2011 in Icibemba reading fluency comprised 71 words for children to read in one minute. *Reading comprehension*: The assessment was based on the on the reading comprehension passage. After reading the passage, learners were asked five questions that required them to remember what they had read. The maximum points were 5. *Listening comprehension*: Learners were assessed in the ability to answer questions based on the oral passage. The passage was read to each child individually and the child was asked 3 oral. The maximum points were 3. Assessors administered the EGRA tests using a "stop" rule where the test was discontinued if a learner was unable to respond correctly to any of the items in the first line (RTI, 2012).

A field testing pilot was conducted in Central, Copperbelt, Luapula and Northern provinces and the sample size was 400 Grade 2 pupils and 400 Grade 3 pupils in 10 schools with at least 20 Grade 2 and 20 Grade 3 pupils randomly selected from each of the four provinces. Within each school, one second grade and one third grade were chosen from which 10 pupils were randomly selected. Table 4 shows the results of the proportion of scores for all subtasks for Grade 2 and 3 EGRA pilot:

TABLE 4   Summary scores for EGRA pilot 2011

	Overall % of zero scorers (Grade 2 & 3)	Grade 2			Grade 3			Total
		Total	Female	Male	Total	Female	Male	
Letter-sound	46.12	3.68	3.00	4.35	6.85	6.72	6.98	5.26
Unfamiliar words	81.60	0.76	0.67	0.85	2.89	2.71	3.07	1.83
Oral reading fluency	84.52	1.30	1.06	1.54	4.46	4.51	4.41	2.88
Reading comprehension	88.60	0.09	0.07	3.01	0.24	0.26	0.23	0.17
Listening Comprehension	20.22	1.47	1.41	1.53	1.99	1.97	2.00	1.73

According to RTI (2012), in Grade 2, pupils produced sounds of almost four letters per minute but could read less than one unfamiliar word, while in Grade

3; pupils could correctly produce the sounds of 6.85 letters and read 2.89 unfamiliar words per minute. Findings from the pilot showed that learners' skills in reading comprehension scores were as low as 1.7% in Grade 2 and 4.9% in Grade 3. However, listening comprehension scores were much higher with an average of 49.0% in Grade 2 and 66.3% in Grade 3.

In 2012, the Read To Succeed project further supported the Ministry of General Education to adapt EGRA to three more additional languages, Cinyanja, Kiikaonde and Silozi. The EGRA tests were developed differently in each language following a given framework, and because of translation differences the results of different languages cannot be compared without additional analyses of their comparativeness (e.g. Multiple-Group Confirmatory Factor Analysis (MGCFA). In order to verify further the levels of reading, this study is based on the EGRA test results obtained in 2014 in four languages, Cinyanja, Icibemba, Kiikaonde and Silozi. The EGRA test results for 2014 are used to find out the levels of reading skills obtained by children in familiar language by end of Grade 2. In this study, I looked at which of these two programs, PRP and PLP, using different instructional methods resulted in better reading skills among Grade 2 learners in familiar language.

There is a need to ascertain the status of the results of the available instruction from the beginning of children's school career. In order to evaluate the effects of education policy, good assessment tools need to be developed for measurement of learning skills. In this research, to determine the levels of reading in early grades by Grade 2 in familiar languages, adaptations of Early Grade Reading Assessment (EGRA) tests were used. I used the EGRA tests as a balanced way of comparing the effects of reading instruction in the two literacy programs on learners' levels of reading skills in familiar language by end of Grade 2. I compared learners' levels of reading skills, looking at six research variables for each language of instruction, home language and I also compared levels of reading skills obtained by boys and girls.

4   AIMS OF THE RESEARCH

The aim of this research was to examine the levels of reading skills acquired by the learners who have followed reading instruction for two different programs, Primary Reading Program (PRP) and Primary Literacy Program (PLP) by end of Grade 2. This was done by comparing the two programs in order to determine which program offers better reading skills in four familiar languages, Cinyanja, Icibemba, Kiikaonde and Silozi. The information from this research will help the Ministry of General Education to determine whether PLP using phonics-based approach that has been implemented from 2014 is indeed enabling learners to read in familiar language earlier than before.

From 1995 to 2013, including the time when the Primary Reading Program was introduced, the approach was mainly the language experience approach that focused on the look-and-say method of teaching. Teaching, where learners could practice blending letter-sounds to form syllables and words, was very limited to about 5 to 10 minutes. Since the reading levels were low, the Ministry of General Education introduced PLP from 2014. This provides more time (approximately 5 hours per week in terms 1 and 2) allocation for teaching and practicing to learn letter-sounds, form syllables and words, and to read them. The most specific aim of this research was to establish if the most recent program PLP, using five key components to learn to read (phonemic awareness, phonics, fluency, vocabulary and comprehension), suffices to improve sufficiently the levels of reading in Cinyanja, Icibemba, Kiikaonde and Silozi by end of Grade 2.

From the seven languages used for education purposes in ten regions of Zambia, results associated with four were observed in this research, Cinyanja, Icibemba, Kiikaonde and Silozi. These are the languages that cover areas where PRP and PLP were implemented at the time of research. The specific aims of the research were to:

a) establish how Primary Reading Program (PRP) helped children to acquire basic reading skills

b) find out how Primary Literacy Program (PLP) has helped children to acquire basic reading skills
c) compare the outcomes of PRP and PLP on children's reading ability in familiar language in grade 2.

To answer my questions, I examined the reading levels acquired by learners in each of the two programs and compared the effects of these two programs based on six variables for each of the four languages, in design where familiar language is or is not the same as home language and the effects of the two programs on boys and girls..

I divided my research into three studies as follows: In Study I, I examined whether reading instruction for the Primary Reading Program (PRP provided during 2014) has helped children to acquire basic reading skills by the end of Grade 2. In Study II, I examined whether reading instruction for the recently implemented Primary Literacy Program (PLP provided during 2014) has helped children to acquire basic reading skills by the end of Grade 2. In Study III, I compared the impact resulting from PRP and PLP-based instructions (provided during 2014) on children's ability to acquire basic reading skills of familiar languages.

My general hypothesis was that, as a result of the more phonics-based reading instruction method, learners in PLP have better reading skills than learners in PRP. I therefore wanted to answer the following specific research questions:

1. What are the levels of reading skills acquired by learners by the end of Grade 2 in familiar language who are following the different reading instruction methods for each of the programs, PRP and PLP?
2. Does the use of home (home language) for reading instruction result in better acquisition of reading-related skills in PRP and in PLP?
3. Are there differences in reading-related skills for boys and girls following reading instruction in each of the programs, PRP and PLP?
4. Comparing the two programs, are there differences in reading related skills by language, by use of home language and for boys and girls in each of the language of instruction?

Results from this study may highlight some issues that require attention to the most recent program PLP so that learners are prepared more adequately in reading by Grade 2 before they proceed to higher grades and are introduced to reading in the English language. According to the Mathew Effect in Reading, described by Gove and Cvelich (2011), as cited in Ministry of Education, Science, Vocational Training and Early Education (2013) in the National Literacy Framework , children below a certain level by end of Grade 1, stay behind forever, and the gap widens, and if they cannot read, they fall behind in everything else. In the Global Campaign for Education Policy Brief (2014), it is reported that learning to read is a complex process that should happen as soon as

children enter school, especially those without any opportunity to receive pre-school. According to the Brief, if children are not able to read well by third grade, they are likely to struggle to catch up and may never become fluent and confident readers. The Brief also notes that there is substantial evidence to suggest that mother-tongue education programs are capable of producing functionally literate readers in 2 to 3 years, rather than the 5 reported for many second language medium programs. Results of this research will provide important knowledge concerning the needs relating to further development of instruction-related activities for literacy in Zambia.

5 METHODS

5.1 Study I: How Primary Reading Program (PRP) has helped children to acquire basic reading skills

In this section, I describe the properties for all of the three studies since they are based on the same variables and languages, except where the properties are different for each study and for the purpose of describing results.

5.1.1 Introduction

By conducting this study, I wanted to find out how reading instruction using the Primary Reading Program helped children to acquire basic reading skills in familiar language by end of Grade 2. The aim was to establish the level of reading skills acquired by learners by end of Grade 2 who were following reading instruction for Primary Reading Program (PRP) in familiar language. The Primary Reading Program was introduced in schools from 1999 to 2014. The aim was to improve reading skills among children in primary schools, from Grade 1 to 7. Zambia has identified 7 languages that are used as lingua francaes in ten regions of Zambia (Cinyanja, Icibemba, Kiikaonde, Silozi, Chitonga, Lunda, Luvale). These are the languages used for education purposes and learning to read in schools and are referred to as familiar languages. According to EFA Global Monitoring Report (2013), many African nations recognize that use of familiar language for initial literacy instruction leads to better learning outcomes than if children are instructed to read in a foreign language like English.

5.1.2 Specific aims of the study

By conducting this study, I was interested to know the levels of reading skills of the learners who were instructed to read in four familiar languages, Cinyanja, Icibemba, Kiikaonde and Silozi by end of Grade 2 by following the PRP. I was interested to know how the learners who developed reading skills in Grade 1

by following New Breakthrough To Literacy (NBTL) course in Grade 1 sustained and improved reading skills in familiar language in Grade 2 since they were affected by being introduced to learn to read in English language and continued to learn to read in Zambian language as a subject in Grade 2. I wanted to see the levels of reading skills acquired by learners instructed to read in PRP by Grade 2.In other countries like Finland, learners begin to read early and very quickly in Finnish, as indicated by Education at a Glance: Organization for Economic Co-operation and Development (OECD) (2010).

Therefore, Study I aims to answer the following specific questions:

I.   What is the level of reading skills acquired by learners instructed to read in familiar language at the end of Grade 2?
II. Are there differences in the level of reading skills between learners whose home language was equal to instructional language and learners whose home language was not equal to instructional language?
III. Does PRP enable boys and girls acquire basic reading skills equally?

5.1.3 Ethical considerations

Studies I, II and III were part of a larger study for Reading Support for Zambian Children (RESUZ) which was conducted in schools in Lusaka in Cinyanja in joint agreement between the Ministry of General Education and University of Zambia and University of Jyväskylä. Consequently, permission for the study was granted by the Ministry of General Education to all five researchers under RESUZ. The Ministry of General Education has an interest to promote research that contributes to improving the quality of education.

Each child did not sign a consent form since consent had already been given by the Ministry of General Education for the study and school head teachers were directed to accommodate the research. In the context of children making their own decision whether or not to participate in the research, the act in Zambia is similar to that of Finnish in section four paragraph one of the Child custody and Right of Access Act (361/1983) where a guardian has a right to decide on a child's personal matters. However, it is not necessary to request a guardian's permission if the director of an institution of early childhood education and care or the head teacher of a school has evaluated that the study would produce useful information for the institution or school and can be carried out as part of the normal activities of the institution or school. Early Grade Reading Assessment (EGRA) tests, the results of which are used for this study, were conducted during school hours as part of the learning process. During the time of testing, instead of children in the sample learning other subjects, the time was used to conduct Early Grade Reading Assessment (EGRA) tests while other children, who were not selected in the sample, were given revision activities. In theory, the assessment tests acted as revision for the children. However, at the beginning of the test, children were informed that they were free to participate

or not in the test or to withdrawal from the tests if they felt so inclined or felt unwell. Learners were also assured of anonymity and confidentiality of the test results. In all the three studies, there was respect for a minor's autonomy and the principle of voluntary participation was considered.

5.1.4 Participants

The sample of the PRP study comprised 393 learners (196 girls and 197 boys) from 40 schools, randomly selected from 4 districts (Katete, Mpika, Kasempa, Kaoma) in Eastern, Muchinga, North Western and Western provinces. Within each school, 10 learners (5 girls and 5 boys) were randomly selected from one Grade 2 class by using a class register. These provinces have many schools located in very remote rural areas and have high poverty levels classified at Eastern 79%, Muchinga 78%, North Western (72%) and Western (84%). Table 5 shows percentages of children who were tested in familiar language under PRP.

TABLE 5   Sample size and percentage of learners assessed for PRP by test language

	N	Percentage
Cinyanja	99	25.2
Icibemba	99	25.2
Kiikaonde	96	24.4
Silozi	99	25.2
Total	393	100

Similarly, as with the other two studies, in each zone schools were selected by simple random sampling from the sampling frame obtained from the Ministry of General Education. The selection of learners was done at each school by random sampling using Grade 2 registers. The sample size comprised 10 Grade 2 learners (5 boys; 5 girls) per classroom in each district. Because of examinations, some schools did not have more than 9 learners and all learners present were tested. This is because during a period of examinations, most schools do not allow learners in lower grades to come to school because furniture and classrooms are used by those candidates writing examinations.

5.1.5 Context of the study

Primary Reading Program was implemented in all ten provinces of Zambia from 1999 to 2013 and covered all primary schools. The aim of the program was to improve learner performance in reading. For this study only, assessment was conducted only in four languages (Cinyanja, Icibemba, Kiikaonde, and Silozi) in four districts (Katete, Mpika, Kasempa, Kaoma). During PRP, English was the medium for all subjects but familiar languages were used for learning to read in Grade 1 by following the New Breakthrough To Literacy course (NBTL). Children transitioned to learn to read English language from Grade 2 and continued to learn to read familiar language during Zambian language lessons. Children

were introduced to read English from the beginning of the second year the end of which was the assessment time for the present study which focused on assessing skills in familiar languages. Table 6 shows provinces, districts that were implementing PRP where this study was conducted and the language of instruction used for each district.

TABLE 6   PRP areas and languages

Province	Program	District	Language of instruction
Chipata	PRP	Katete	Cinyanja
Muchinga	PRP	Mpika	IciBemba
North Western	PRP	Kasempa	Kiikaonde
Western	PRP	Kaoma	Silozi

These provinces have a large number of schools in rural areas and many children come from poor families where support for literacy is very minimal. Three quarters of the families in these provinces depend on farming and rearing cattle and spend most of their time looking for food. The four languages used for this study are part of the seven languages classified as lingua francae in ten regions of Zambia and used in schools. The languages are also used for learning to read and as subjects from pre-school to Grade 7. However, these languages are not home languages for some children. Some children speak different languages at home from those that are used at school for learning as familiar languages. According to what Ball (2011) observed in a paper for UNESCO about mother tongue-based bilingual of multilingual education in the early years, it was expected that such children can learn the familiar language very quickly by interacting with peers while at school. In this study I used four languages (Cinyanja, Icibemba, Kiikaonde, and Silozi) because these are the languages used as media of instruction in four districts selected in the sample of study for PRP. Also, the EGRA tool was only available in these four languages out of seven familiar languages used in schools. I decided to conduct this study using Early Grade Assessment data because I wanted to use a large sample that spreads across sixteen districts and four languages; this gave me a sample of areas where EGRA was used to assess levels of reading for Grade 2.

During the implementation of the Primary Reading Program from 1999 to 2013, English language was the medium for all subjects and the familiar languages were used for learning to read in Grade 1 by following New Breakthrough to Literacy course (NBTL) with an additional course for oral English called Pathway 1. During PRP, most of the children went to school with very little exposure to reading materials or reading instruction. Therefore, apart from learning to read, the children need relevant materials that are in their familiar languages. Table 7 is an approximation of district profile for Grades 1 – 9 as at (Ministry of Education, 2008):

TABLE 7   Districts profiles

District	Basic schools (1-9)	Girls	Boys	No. of teachers	Pupil: teacher ratio	Pupil: book ratio
Katete	110	19515	19581	695	61	2.5
Mpika	188	24298	20957	695	62	2.8
Kaoma	137	22214	19599	752	56	2.4
Kasempa	66	8998	10319	425	48	1.9

5.1.6   Research design for PRP

The Primary Reading Program (PRP) was implemented from 1999 to 2014. At the time of conducting this study in October to November 2014, PRP was the program that was implemented by all schools country wide, except in twelve districts where PLP was being piloted from 2013 beginning with Grade 1. In this study four districts Katete, Mpika, Kasempa and Kaoma were included in EGGRA assessment tests with total randomly selected samples of 40 schools and 393 learners who were being instructed to read following the Primary Reading Program Program from Grade 1 to Grade 2 from 2013 to 2014. Therefore, since Katete, Mpika, Kasempa and Kaoma were not of those districts supported by Read To Succeed Project in 2014, Grade 2 learners were still following reading instruction under Primary Reading Program (PRP). In order to examine the results of PRP EGRA test results were used. Because of huge zero peak scores in the variables where normality assumption was rejected, results for PRP were determined by looking at percentages of zero scorers, comparing reading skills between learners whose home language was equal to instructional language against learners whose home language was not equal to instructional language and between boys and girls for learners who were instructed to read in PRP in four languages.

5.1.7   Data collection: Early Grade Reading Assessment (EGRA)

EGRA assessment tests have been used in all of my three studies in exactly the same way. Several assessment tests conducted in Zambia (e.g. Kanyika (2002), Read To Succeed Project (2013), Matafwali & Bus (2013), and National Assessment (2003)) showed low reading levels among the children in primary schools. This great concern prompted me to assess learners' reading levels by end of Grade 2 within different multilingual environments. I saw the need to assess the levels of children at the end of Grade 2 after they have acquired reading skills in familiar languages for at least two years during the Primary Reading Program implemented from 1999 and during the Primary Literacy Program implemented from 2014. For PRP, learners were introduced to learn to read and write in grade 1 in familiar language and introduced to English by following Step In To English course in Grade 2, and continued to learn to read in familiar language during Zambian language lessons in Grade 2. In PLP, learners were

instructed to learn to read in familiar language for two years from grade 1 to 2. As has been explained earlier, the data was collected by using the Early Grade Reading Assessment (EGRA) instrument adapted to assess learners in orientation to print, letter-sound knowledge, non-word reading, oral passage reading, reading comprehension and listening comprehension in Cinyanja, Icibemba, Kiikaonde and Silozi. Table 8 shows the variables that were tested and their theoretical maximum scores.

TABLE 8   Maximum scores for PRP and PLP for each variable

Task:	Theoretical maximum scores			
	Cinyanja	Icibemba	Kiikaonde	Silozi
orientation to print	3	3	3	3
letter-sound knowledge	100	100	100	100
non word decoding	50	50	50	50
oral passage reading	40	47	56	32
reading comprehension	5	5	5	5
listening comprehension	5	5	5	5

The following is the description of each test item and how the item was tested in Cinyanja, Icibemba, Kiikaonde and Silozi in 2014:

Orientation to print: Learners were assessed on how well they were prepared for reading. In this test, a learner was shown a written paragraph segment in the learner's stimuli packet. The test administrator asked the participant where s/he would begin to read, the direction of reading and, at the end of the line, where the learner would read next. The test was conducted in 60 seconds. The maximum score was 3 points. Orientation to print was administered at the beginning as a way of preparing a child to read by being asked to point where to begin to read or where the sentence began and ended, and reading from top to bottom. This was also a way of ensuring that a child relaxed before beginning to read other texts.

Letter sound knowledge (phonemic awareness):   This was a timed test where learners were given 60 seconds in which to sound out as many letter sounds (not those used in the recitation of English letter names) as possible out of 100 letters (some repeated) selected in familiar language. Letters only occurring in borrowed words were not included. The test involved beginning from the first row, moving from left to right across the page to the last tenth row with 100 letters with 10 letters on each row (some repeated) on display. E.g. for Cinyanja *m N A J K u I k m* and *d* were used in 2014. The assessor instructed the child to give sounds of the letters and not letter names. After, the assessor gave an example on letters *A, P* and *L*. The assessor allowed the learner to practice on two other letter names *p* and *l* before asking the child to identify other letter names. The test was discontinued when a learner scored all letters incorrectly on the

first line. If a child hesitated or stopped on a letter for 3 seconds, the assessor asked the child to read the next letter.

Non-Word Decoding /Reading: The test was aimed at assessing learners on their ability to decipher words that follow linguistic rules but do not actually exist in familiar language. Learners were given 60 seconds to read 50 items as carefully as possible, reading across the page, beginning with any of the letters of familiar language (not those used in loan words only) and containing at least two subsequent letters, most with more, from 3 to 6 letters. For example, the first line contains the following non-words for Cinyanja: *kelo*, *nipe*, *gelu*, *atapi*, *mdzimu*. For each non-word read, a child scored 1 point. This was done in order to arrange the words from simple to more difficult. The test was discontinued if a learner failed to read any of the items in the first row which contained five non-words in all four languages. Before asking the child to read as many words as possible, the assessor gave an example by reading a made up word (e.g."*oli*"). The assessor also asked the learner to practice by reading two other non-words (e.g. *Koki*" and "*Cota*" for Cinyanja) before asking the child to read as many words as possible within the given time.

Oral passage reading: The test was administered to assess learner's reading fluency by reading a connected text. Instructions were given to the child about reading aloud a short passage within a stipulated time. The story comprised of 7 sentences in Cinyanja, 6 sentences in Icibemba, 7 sentences in Kiikaonde and 5 sentences in Silozi. The learner was assessed according to the number of words read correctly out of 40 words for Cinyanja, out of 47 words for Icibemba, out of 56 words for Kiikaonde and out of 32 words for Silozi within 60 seconds. The test was stopped if the child did not read a single correct word on the first sentence which contained 6 words for Cinyanja, Kiikaonde and Silozi and 9 words for Icibemba.

Reading comprehension: This test assessed the learner's ability to understand what was read by answering questions based on the passage read in *Oral passage reading and listening comprehension*. After the oral passage reading, the child was asked to answer oral 'wh-questions' (*where, what, why, who, how*). This was to test the learners' basic understanding of the story and no more than 15 seconds was allocated to answering of each question. There were five questions asked, each carrying 1 point for a total of 5 points. In addition, this test was not done if the learner scored zero in oral passage reading.

Listening comprehension: This test assessed the learner's ability to follow and understand a simple orally-delivered story containing 34 words. The test also required the learners to concentrate and focus in order to understand and remember enough about the story read by the assessor and then to answer both literal and inferential questions without asking for repetition of the story. A child was asked to answer 5 questions based on the short text. In this assessment, a learner was allocated no more than 30 seconds in which to answer each question. Each question carried 1 point and the total was 5 points.

Selected students from the Psychology Department at the University of Zambia who had already been trained to assess learners in Graphogame under

RESUZ and some former Ministry of General Education officials who had retired from service were hired to test the children. The use of University of Zambia students and retired personnel was done in order to avoid using teachers who were teaching and other Ministry of General Education officials who were committed to their duties. In order to ensure correct procedures and to create child friendly administration of EGRA, the assessors were trained for five days by Read To Succeed Project officials who were conversant with EGRA procedures and testing. Special emphasis was given to train the assessors in letter-sound knowledge so that they were able to give correct scores for letter-sounds in familiar language and not, letters of the English alphabet. Having been trained, the assessors administered the tests orally to individual learners within approximately 15 minutes during which they also collected information on learners' background. The EGRA tests were administered at the same time in all of the sixteen districts from mid-October to mid November 2014.

5.1.8 Reliability of the tests - General statement about EGRA

Carole and Almut (2008) point out that the key indicators of the quality of a measuring instrument are the reliability and validity of the measures. Validity is the extent to which an instrument measures what it purports to measure. Reliability is the true score a person should have received if the instrument were perfectly accurate. In view of this, even though the EGRA test is internationally administered even in other countries, because it was adapted in Zambia to suit the curriculum content for familiar languages, it was pre-tested but in only one language Cinyanja in order to ensure reliability and validity. This was done as part of training at 9 Government schools in Lusaka and feedback from pre-tested questionnaires was used for editing the final questionnaire before teams were deployed to the field (Research Trianle Institute (RTI), 2013). This may not have been sufficient to affirm the test's validity and reliability. In this case, it may be wise to compare EGRA test scores with results from measures such as those obtained by teachers during week 5 and week 10. This may help to determine the differences of learners' performance in EGRA with teachers' scores. Diagnostic and assessment tools are crucial to improve the quality of education and make it more equitable because such assessments are helpful in diagnosing learning difficulties especially among low achievers (Global Education and Monitoring Report, 2016).

In addition, assessors were trained involving five days of intensive practice in how to assess learners. In 2012, the assessors were trained in conducting the tests manually. However, in 2014, the tests were conducted using tablets on which learners' background information and responses were recorded. The assessors were given a maximum of two weeks to complete administration of the tests. In some cases, in districts with schools difficult to access, three weeks were given to complete test administration. In this case, the assessors were new people to the children. In such a situation the younger the child, the more difficult it can be to obtain valid scores. Performance is highly influenced by the

child's emotional state, and experience, so that the test scores across time may be relatively unstable (Epistein et al., 2004).

Apart from the adaptation that was done in 2011 in one language, Icibemba and the adaptation made by RTS in four languages in 2012 in Cinyanja, Icibemba, Kiikaonde and Silozi, EGRA was further adapted for all seven familiar languages (Cinyanja, Icibemba, Silozi, Kiikaonde, Chitonga, Lunda and Luvale) in 2014 through Education Data for Decision Making (EdDataII) with support from USAID/Zambia Education project and Department for International Development (DFID) in collaboration with Examination Council of Zambia under Ministry of General Education. This was done in preparation for the National Assessment Survey of Learning Achievement at Grade 2 that was similarly conducted in November 2014. According to the report by Research Triangle Institute (RTI) International (2015) using Cronbach's alpha, checking of the internal consistency and reliability of test instruments for each of the seven familiar languages revealed scores for Chitonga 0.74, Cinyanja 0.82, Icibemba 0.80, Kiikaonde 0.80, Lunda 0.87, Luvale 0.75 and Silozi 0.82 (RTI, 2015). An alpha value over 0.70 is considered acceptable and a value over 0.80 is considered as a good value. In addition, construct validity was assessed by examining the item hierarchy, or the ordering of items within a subtask, from easy to difficult, that results from an item level analysis during the Rasch measurement (RTI, 2015). This means that the results based on the instruments were adjusted according to these scores.

5.1.9   Data analysis

In this research zero scorers were used instead of comparing the normal distributions. In normal situation by end of Grade 2 zero scorers should be random, but in this case learners scored zero was severe, and one way to analyze the data is to concentrate on the restricted area only, the zero scorers. It was assumed that language had no effect on zero scorers since languages were not compared. In restricted point estimates, it is important to show proportions in most severe situations and zero scorers in data are also important.

In all the three studies (Study I, II and III), data analysis was conducted using SPSS version 2012. A large percentage of zero scorers were observed in most of the six variables. In order to have a statistical description of the data, histograms were used. The hypothesis of normality was rejected because of huge zero peak in the variables letter sound knowledge, non-word decoding and oral passage reading. In reading comprehension, the amount of zero scorers was large and the distribution was very rightward skewed, in orientation to print the distribution was very kurtotic and leftward skewed, with the same in listening comprehension but with less skewed distribution. In all variables, the Shapiro-Wilk's test gave significant results, rejecting the normality assumption. As a result, instead of using parametric tests, nonparametric Mann-Whitney U-tests were used. Comparing the levels of learners' reading skills was done in each test language separately because the differences between the language adaptations could have an effect on the results. There was no Multi-group Con-

firmatory Factory Analyze (MGCFA) for the test languages. Because analyses consists multiple testing to avoid Type I error, the p-values were adjusted with the Holm (1979) procedure and this was selected because it generally has more power than Bonferroni. As the effect size measure, Pearson's correlation coefficient r was selected because of the non-parametric tests (Field, 2009). The effect sizes were evaluated according to Cohen's (1992) suggestions. In this study, there were only 9 missing values. The missingness varied within test languages between 0.0 - 0.8 percentages and within programs from 0.0 to 0.3 percentages which was much lower than the thumb rule of 5-10% (Dong & Peng, 2013). Therefore, it was assumed that, with this very low level of missingness, there would be practically no biased effect on the results, even though the hypothesis of missing completely at random (MCAR) was rejected (Little's MCAR test: $\chi^2=61,649$, df=14, p<.001).

Equally, histograms showed a high floor effect in both Primary Reading Program and Primary Literacy Program in letter sound knowledge, non-word decoding, oral passage reading and reading comprehension. The only variables which did not show zero peaks were orientation to print and listening comprehension. The distributional features did not change much after the sample was divided by the program groups of PLP and PRP.

5.1.10 Data properties

I decided to use Early Grade Reading Assessment test results collected from mid-October to mid November 2014 when learners were tested in six variables in four languages. At this time, learners had followed 7 of the 9 months of the second grade teaching. I wanted to explore the results of each program, PRP and PLP, and compare their results to determine which program resulted in better results. For Studies I, II and III I used levels of learners' reading skills obtained by end of Grade 2 by following each of the programs in six variables (orientation to print, letter-sound knowledge, non-word decoding, oral passage reading, reading comprehension and listening comprehension) in four languages (Cinyanja, Icibemba, Kiikaonde, Silozi). I examine each of the programs to determine results and compared reading skills obtained by learners between PRP and PLP. This was done in Study I, II and III by examining percentage of zero scorers, by language, when home language was equal or not equal to language of instruction and by gender. I also looked at the differences between boys and girls. As indicated in earlier sections, PRP learners were instructed to read in familiar language for one year in Grade 1 and transitioned to learn to read in English, as they continued to learn to read in familiar language during Zambian language lessons. In PLP, learners were instructed to learn to read in familiar language for two years from Grade 1 to 2. In examining each of the two programs, PRP and PLP, and making comparisons, I used EGRA test results which were administered at the same time in all of the 20 districts from mid-October to mid November 2014 with a total sample of 1,986 learners.

5.2 Study II: How Primary Literacy Program (PLP) has helped children to acquire basic reading skills

5.2.1 Introduction

Ethical considerations, research design, data collection, reliability of the EGRA, data analysis and data properties are the same as in Study I and their descriptions were not repeated in this Study II in order to avoid repetitions. This is because the same methods were used for the same data.

In this study, I was interested to know if the learners who were instructed to read in four of these familiar languages, Cinyanja, Icibemba, Kiikaonde and Silozi had acquired sufficient reading skills by end of Grade 2 by following the PLP. I was interested to know the levels of reading skills for learners who followed reading instruction for PLP which emphasized the teaching of letter-sounds in grade 1 and 2 in familiar languages. I wanted to see if using PLP, which is based on phonics-based approach with emphasis on letter-sounds for teaching reading, enables learners to acquire basic literacy skills as early as Grade 2. To find out, I examined the levels of reading skills for each variable by language and gender. Based on the results of this study, I also wanted to inform the Ministry of General Education about how PLP is working so that measures could be taken for improvement. If the curriculum in Zambia is to provide sufficient literacy skills before grade 4, it is obvious that children who fail to acquire basic reading skills at the end of second grade are at high risk. If children have not mastered reading skills in familiar language before end of second grade, there is little hope that they will be able to catch up as they move to higher grades.

5.2.2 Specific aims of the study

The specific aim of this study was to find out the level of reading skills by end of Grade 2 acquired by learners who were following reading instruction in PLP in familiar language by end of Grade 2. Therefore, the aim of Study II was to answer the following specific questions:

I. What is the level of reading skills by end of Grade 2 acquired by learners instructed to read in familiar language?
II. Are there differences in the level of reading skills between learners whose home language was equal to instructional language and learners whose home language was not equal to instructional language?
III. Does PLP enable boys and girls acquire basic reading skills equally?

5.2.3 Participants

The sample of the study comprised 1593 learners (799 girls and 794 boys) from 160 schools randomly selected from 12 districts (Chipata, Lundazi, Mansa, Mwense, Chinsali, Isoka, Mporokoso, Mungwi, Mufumbwe, Solwezi, Mongu,

Seseke) in Eastern, Muchinga, North Western and Western provinces. Table 9 shows the percentage of learners who were tested in familiar language under PLP.

TABLE 9   Learners assessed in familiar language for PLP

	N	Percentage
Cinyanja	392	25
Icibemba	401	25
Silozi	400	25
Kiikaonde	400	25
Total	1593	100

5.2.4   Context of the study

The Primary Literacy Program (PLP) was implemented in 2013 as a pilot with support from the Read To Succeed project in six provinces covering all schools in twelve districts. The aim of the program was to improve learner performance in reading. For this study, assessment was conducted only in four languages (Cinyanja, Icibemba, Kiikaonde, Silozi) in twelve districts (Chipata, Lundazi, Mansa, Mwense, Chinsali, Isoka, Mporokoso, Mungwi, Mufumbwe, Solwezi, Mongu and Seseke). During PLP, familiar language was used for learning to read from Grade 1 to 2, the end of which was the assessment time for the present study which focused on assessing skills in familiar languages. Familiar language was also used as the medium of instruction for learning all subjects from Grade 1 to 4. Table 10 shows the provinces and districts that began implementing PLP as a pilot in 2013 and the language of instruction used in each district.

TABLE 10   PLP areas and languages

Province	Program	District	Language of inst-ruction
Eastern	PLP	Chipata	Cinyanja
	PLP	Lundazi	Cinyanja
Luapula	PLP	Mansa	Bemba
	PLP	Mwense	Bemba
Muchinga	PLP	Chinsali	Bemba
	PLP	Isoka	Bemba
Northern	PLP	Mporokoso	Bemba
	PLP	Mungwi	Bemba
North Western	PLP	Mufumbwe	Kiikaonde
	PLP	Solwezi	Kiikaonde
Western	PLP	Mongu	Silozi
	PLP	Seseke	Silozi

According to the Ministry of Education (2008) Statistical Bulletin, 79.3% of schools are located in rural areas. These six provinces, Eastern, Luapula,

Muchinga, Northern, North Western and Western, were selected to start to implement the program because most of the schools are located in rural areas and many children come from poor families where poverty is at a high level. Most of the families in these provinces depend on subsistence farming and spend most of their time looking for food.

During PLP from 2014, all learners are instructed to read in familiar language from Grade 1 to 2 and Zambian language is used as the medium of instruction from pre-school to Grade 4. English language is introduced as oral from Grade 2 and for learning to read and writing from Grade 3. This means that, with the PLP program, children are instructed to read in familiar language for two years before they are introduced to English. To ensure that children acquire strong foundation skills in literacy and numeracy, schools need to teach the curriculum in a language that children understand (Global Education Monitoring Report, 2016). There are close to 20,000 learners in these six provinces instructed to read by about 2698 teachers. The national teacher: pupil ratio stands at 46.2 with a pupil: book ratio at 2:1. Most of the children have not been exposed to any form of reading materials before they go to school because they do not have the chance to go to pre-schools in rural areas and reading material is very scarce in familiar languages.

5.2.5 Research design

The Primary Literacy Program (PLP) was implemented in 2014 and started with Grade 1 and its implementation was to follow a phased approach of moving from one grade to another year by year while materials were being produced side by side with implementation. Read To Succeed Project was supporting the Ministry of Education, Science and Vocational Training and Early Education to pilot the literacy courses under the Primary Literacy Program. Therefore, in twelve districts where Read To Succeed Project was supporting the Ministry to pilot PLP under the revised curriculum, learners were ahead by one year and in 2014 had reached Grade 2. The twelve districts are Chipata, Lundazi, Mansa, Mwense, Chinsali, Isoka, Mporokoso, Mungwi, Mufumbwe, Solwezi, Mongu and Sesheke. This is why learners in these twelve districts are classified as being instructed to read under Primary Literacy Program (PLP) introduced from 2013 in pilot schools. Therefore this Study II examined level of reading skills acquired by learners who were instructed to read following PLP for two years from 2013 to 2014. In order to determine results of PLP, EGRA test results were used. Because of zero peak scores in the variables where normality assumption was rejected in PLP, results were determined by looking at percentages of zero scorers, comparing levels of reading skills between learners whose home language was the same as the instructional language and learners whose home language was not same as instructional language and between boys and girls for learners who were instructed to read in PLP in four languages.

5.3 Study III: The outcomes of Primary Reading Program (PRP) and Primary Literacy Program (PLP) on children's reading ability in familiar language in Grade 2

5.3.1 Introduction

Ethical considerations, research design, data collection, reliability of the EGRA, data analysis and data properties were the same as in Studies I and II, and their descriptions are not repeated above.

In this study I wanted to find out if there is a difference in the results of learners' reading skills when using PRP and PLP to learn to read. In this cross-sectional study, I compared the reading skills acquired by learners who followed these two programs from Grade 1 to Grade 2 in four different languages, Icibemba, Cinyanja, Silozi and Kiikaonde, respectively. I wanted to see if there are differences in reading skills acquired by learners in these four languages by second grade under two different programs, the Primary Reading Program and the Primary Literacy Program. Under the revised curriculum children in PLP have a longer period of time to learn to read in familiar language. To ensure that children acquire strong basic skills in literacy and numeracy, schools need to teach the curriculum in a language that children understand (UNESCO, 2016). However, it is important to follow up the development of learners' reading skills early so that measures can be taken quickly to improve if there is a problem.

5.3.2 Specific aims of the study

The aim of this study was to compare learners' ability to read in familiar language in PRP and PLP by end of Grade 2. The aim of comparing the two programs was to establish whether the instruction in the most recent program, PLP, which focuses more concretely on a phonics approach, resulted in better reading outcomes than the PRP. Therefore, Study III aimed to answer the following specific question.

Does the PLP phonics-based approach provide better reading skills in familiar language by Grade 2? To answer the question, comparisons of the differences between PRP and PLP were made in:
1. proportion of percentage of zero scorers,
2. reading skills in four languages across six variables,
3. reading skills in home language and familiar language, and
4. reading skills for boys and girls

5.3.3 Participants

The samples of the study comprised 1986 learners (995 girls and 991 boys) from 200 schools, randomly selected from 16 districts (Chipata, Lundazi, Katete, Mansa, Mwense, Chinsali, Isoka, Mpika, Mporokoso, Mungwi, Mufumbwe,

Solwezi, Kasempa, Mongu, Sesheke, Kaoma) in Eastern, Muchinga, North Western and Western provinces. The sample of PRP comprised 393 learners (196 girls and 197 boys) and the sample of PLP comprised 1593 learners (799 girls and 794 boys). Within each school, one second Grade with 10 learners (5 girls and 5 boys) was selected.

For each district, the selection of schools was achieved by random sampling from a list obtained from the Ministry of General Education. Table 11 shows the percentage of learner's different languages spoken at home.

TABLE 11   Classification of learners by Home language

	Program	Home language		Not home language			
		N	%	N	%	Total	%
Cinyanja	PRP	77	5.5	22	3.7		
	PLP	132	9.5	260	43.6	491	24.7
Icibemba	PRP	99	7	0	0		
	PLP	325	23.4	76	12.7	500	25.2
Kiikaonde	PRP	91	6.6	5	1		
	PLP	252	18.1	148	24.8	496	25
Silozi	PRP	44	3.2	55	9		25.1
	PLP	369	26.7	31	5.2	499	25
Total		1389	100	597	100	1986	100

5.3.4   Context of the research

The Primary Reading Program (PRP) was already implemented in all twelve provinces of Zambia from 1999. From the twelve provinces, six were selected to pilot the Primary Literacy Program (PLP) by the Read To Succeed project from 2013. The six provinces were selected for piloting PLP by the Ministry of General Education because these were provinces with the most rural schools that require support. Table 21 shows the provinces, the program and districts in which this study was conducted.

The Primary Reading Program was implemented in all schools countrywide from 1999 to 2013. The Primary Literacy Program was implemented as a pilot from 2013 with support from the Read To Succeed project in six provinces, covering all schools in twelve districts. The aim of both PRP and PLP was to improve learner performance in reading. For this study, assessment was conducted in four languages (Cinyanja, Icibemba, Kiikaonde, Silozi) in four districts (Katete, Mpika, Kasempa, Kaoma) where learners were being instructed to read under PRP and in twelve districts (Chipata, Lundazi, Mansa, Mwense, Chinsali, Isoka, Mporokoso, Mungwi, Mufumbwe, Solwezi, Mongu and Sesheke) where learners were instructed to read under PLP. Table 12 shows the provinces and districts that were implementing PRP and PLP from 2013 to 2014 and the language of instruction used in each district.

TABLE 12   PRP and PLP areas and languages

Province	Program	District	Language of instruction
Eastern	PLP	Chipata	Cinyanja
	PLP	Lundazi	Cinyanja
	PRP	Katete	Cinyanja/ English
Luapula	PLP	Mansa	IciBemba
	PLP	Mwense	IciBemba
Muchinga	PLP	Chinsali	IciBemba
	PLP	Isoka	IciBemba
	PRP	Mpika	IciBemba/ English
Northern	PLP	Mporokoso	IciBemba
	PLP	Mungwi	IciBemba
North	PLP	Mufumbwe	Kiikaonde
Western	PLP	Solwezi	Kiikaonde
	PRP	Kasempa	Kiikaonde/English
Western	PLP	Mongu	Silozi
	PLP	Sesheke	Silozi
	PRP	Kaoma	Silozi/ English

Three quarters of the families in these provinces depend on farming and rearing cattle. Language, ethnicity and poverty can result in an extremely high risk of being left far behind since learners who come from poor households and speak a different language from the language spoken at home are amongst the lowest performers (Global Education Monitoring Report, 2016).

Urban and rural areas in Zambia are drastically different in terms of available literacy materials and print and children are much more exposed to English language in urban areas than in rural areas. The major concern is that, as shown in Table 19, 30.1% of all the tested children were instructed to read in a language that was not their home language. According to the Global Education Monitoring report (2016), it is assumed that every child must be given opportunity to learn in one's own language because to be taught in a language other than one's own disadvantages some leaners and has a negative effect on learning. Previous studies that raise concern for the orthography effect were based on data from Lusaka (Ojanen et al., 2013) where English is more common in everyday use. Rural areas in Eastern, Northern, Luapula, North Western and Western provinces, where the study was based, are very different. Since the majority of the children in this research belong to the rural setting, it is most likely that the basic knowledge children need for learning to read, letter knowledge, is most likely less likely available before school age in rural areas due to lower exposure to visual images of letters. In addition, unlike in urban areas, children are less exposed to English language which most of them are only introduced to when they are in school. Children need relevant materials that are in their familiar languages.

At the time of study, there were close to 8,359 primary schools in the country with 3,075,161 learners. Of these learners, approximately 1,906,600 (62%) learners and 32,835 teachers were in the six provinces sampled for this study. The teachers were trained to teach from Grade 1 to 9. Most of these teachers are

not proficient in the languages they teach (Global Education Monitoring Report, 2016, p. 5). However, the Ministry of General Education policy is that all children follow the same curriculum and teachers have to teach in those languages. If they are not fluent speakers of the languages they teach, they are encouraged to learn the language.

In this study, I used four languages out of seven local familiar languages used in schools because these are the languages used in the six provinces where the Read To Succeed piloted PLP beginning 2013 and learners were in Grade 2 in 2014. Chitonga was not selected because it is used in the Southern province that is not classified to be as poor as the other six provinces selected for the pilot. In addition, the Ministry of Education felt that there were many other projects piloting reading in the Southern province compared to the other six provinces. Lunda and Luvale were not included in the pilot for PLP even though they are used in one of the provinces classified with a high poverty level. This is because, in each province, only two districts were selected for the pilot. Lunda and Luvale are spoken in districts that were not selected for the pilot. I decided to conduct this study using Early Grade Assessment data because I wanted to use a large sample that spreads across sixteen districts and four languages, this gave me a sample of areas where EGRA was used to assess levels of reading for Grade 2 for both PRP and PLP.

5.3.5   Research design

In order to determine which program resulted in better results for Grade 2 learners in familiar language, this study compared results of PRP and PLP that were implemented at the same time from 2013 to 2014. In twelve districts where Read To Succeed Project was supporting the Ministry to pilot PLP, learners were ahead by one year in 2014 and had reached Grade 2. Results of this study were based on EGRA test results of 2014 in four languages (Cinyanja, Icibemba, Kiikaonde and Silozi). The results were used to compare percentages of zero scorers, making comparisons of levels of reading skills in six variables by language, by home language when it was the same as the language of instruction, by home language when it was not the same as language of instruction, by gender and the differences between boys and girls in PRP and PLP

6 RESULTS

6.1 Primary Reading Program (PRP)

In this study there was only one missing value in non-word decoding, oral passage reading, reading comprehension and in listening comprehension. The proportion of missing value was very low (0.0-0.3%). Little's MCAR test result was not significant (χ^2= 22,690, df = 14, p =.066), the missing completely at random assumption was not rejected, listwise and pairwise deletion methods were not causing bias in the data (Enders, 2010). The effect sizes (*r*) of the results were produced according to Field et al. (2012) and were interpreted according to Cohen's (1992) recommendations as small when *.1≤ r <.3*, medium when *.3≤ r <.5* and large when r ≥.5. The analysis of data was done using Mann Whitney U non-parametric tests.

6.1.1 Zero scorers in PRP in each language by six variables

To determine the results of PRP by levels of reading skills acquired by learners the analysis of zero scorers was made because of huge zero peaks that were observed, rejecting the hypothesis of normality.

Descriptive information for Cinyanja in PRP shows a high percentage of zero scorers in letter-sound knowledge, non-word decoding, oral passage reading and in reading comprehension. Proportions in orientation to print and listening comprehension were obviously lower than for the other variables. In Icibemba, for PRP, results show a high percentage of zero scorers in all variables except in listening comprehension. In Kiikaonde, for PRP, results reveal high peaks of zero scorers in letter-sound knowledge, non-word decoding, oral passage reading and reading comprehension. In orientation to print and listening comprehension, proportions were clearly lower. In Silozi, for PRP, results reveal high peaks of zero scorers in all variables except in listening comprehension. Table 13 shows the percentage of zero scorers in Cinyanja, Icibemba, Kiikaonde and Silozi.

TABLE 13   Proportion of zero scorers in PRP in four languages

	N	Cinyanja	N	Icibemba	N	Kiikaon-de	N	Silozi
		Percentage of zero scorers		Percentage of zero scorers		Percentage of zero scorers		Percentage of zero scorers
Orientation to print	99	8.1	99	30.3	96	13.5	99	23.2
Letter-sound knowledge	99	42.4	99	29.3	96	42.7	99	64.6
Non-word de-coding	99	72.7	99	80.8	96	81.3	98	75.8
Oral Passage reading	99	69.7	99	83.8	95	90.6	99	77.8
Reading com-prehension	99	83.8	99	92.9	95	90.6	99	89.9
Listening Comprehension	99	1.0	99	7.1	96	5.2	98	8.1

Overall, in all of the four languages in PRP, results show a high percentage of zero scorers in letter-sound knowledge, non-word decoding, oral passage reading and reading comprehension except for Icibemba and Silozi, which in addition have a higher percentage of zero scorers in orientation to print. Figure 3 shows the proportion of zero scorers in all 6 variables in PRP.
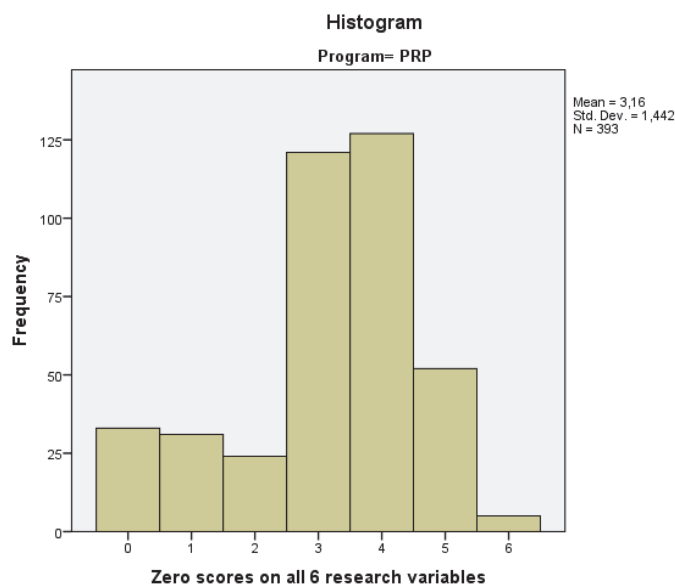
FIGURE 3   Zero scorers in six variables in PRP.

6.1.2 Comparison of reading skills between learners using home language as medium of instruction with learners whose home language is different from language of instruction in PRP

For PRP results show that learners who use Cinyanja as home language as familiar language group (EQ) did not obtain significantly different mean rank scores in all research variables than learners who use a different home language (NOTEQ). Table 14 shows the differences between home language groups in Cinyanja.

TABLE 14   Comparing home language groups in PRP in Cinyanja

		N	Mean rank score	Mann Whitney U	Std. test (z)	Sig.	p_{adj}**	r ***
Orientation to print	EQ	77	50.45	881.5	0.432	.666	1.0	.043
	NOTEQ	22	48.43					
Letter-sound knowledge	EQ	77	48.18	706.5	-1.231	.218	1.0	-.124
	NOTEQ	22	56.39					
Non-word decoding	EQ	77	49.01	771.0	-0.816	.415	1.0	-.082
	NOTEQ	22	53.45					
Oral passage reading	EQ	77	49.49	808.0	-0.404	.686	1.0	-.040
	NOTEQ	22	51.77					
Reading comprehension	EQ	77	49.09	777.0	-0.921	.357	1.0	-.092
	NOTEQ	22	53.18					
Listening comprehension	EQ	77	51.69	977.5	1.147	.252	1.0	.115
	NOTEQ	22	44.07					

EQ= Home language equal to language of instruction   , NOTEQ= Home language not same as language of instruction.
* Standard binomial requirement: n (p) and n (1−p) must both be equal to or greater than 5.
 ** p_{adj} adjustment was done with R to avoid Type I error by following the Holm procedure (1979). In case of p<.001, the calculation was done with the p-value of .0005
*** r= z/ (√N) (Field, 2009), Cohen (1992): Effect size (*r*): .1≤ *r* <.3 small, .3≤ *r* <.5 medium, *r* ≥.5 large effects

In Icibemba, there were no learners in the PRP program under condition home language is not equal to familiar language so the comparison between the programs could not be done.

In Kiikaonde results showed that learners who use Kiikaonde as home language did not obtain significantly different mean rank scores in all variables than learners who use a different language. Table 15 shows the differences between test language and home language in Kiikaonde.

TABLE 15   Comparing home language groups in PRP in Kiikaonde

		N	Mean rank score	Mann Whitney U	Std. test (z)	Sig.	p_{adj} **	r ***
Orientation to print	EQ	91	48.37	215.5	-0.274	.784	1.0	-.028
	NOTEQ	5	50.90					
Letter-sound knowledge	EQ	91	48.91	265.0	0.645	.519	1.0	.066
	NOTEQ	5	41.00					
Non-word decod-ing	EQ	91	48.38	217.0	-0.254	.799	1.0	-.026
	NOTEQ	5	50.60					
Oral passage read-ing	EQ	91	48.18	198.0	0.616	.782	1.0	.063
	NOTEQ	4	44.00					
Reading compre-hension	EQ	91	48.18	198.0	0.538	.782	1.0	.055
	NOTEQ	4	44.00					
Listening compre-hension	EQ	91	48.45	223.0	-0.077	.938	1.0	-.008
	NOTEQ	5	49.40					

EQ= Home language equal to language of instruction   , NOTEQ= Home language not same as language of instruction.

* Standard binomial requirement: n(p) and n(1−p) must both be equal to or greater than 5.

** p_{adj} adjustment was done with R to avoid Type I error by following the Holm procedure (1979). In case of p<.001, the calculation was done with the p-value of .0005

*** r= z/ (√N) (Field, 2009), Cohen (1992): Effect size (*r*): .1≤ *r* <.3 small, .3≤ *r* <.5 medium, *r* ≥.5 large effects

In Silozi results reveal that learners having Silozi as some language obtained significantly higher mean rank scores in reading comprehension and listening comprehension. The effect size in reading comprehension was medium and in listening comprehension large. Table 16 shows the differences between test language and home language in Silozi.

TABLE 16   Comparing home language groups in PRP in Silozi

		N	Mean rank score	Mann Whitney U	Std. test (z)	Sig.	p_{adj}**	r ***
Orientation to print	EQ	44	54.26	1397.5	1.448	.147	.294	.146
	NOTEQ	55	46.59					
Letter-sound knowledge	EQ	44	51.30	1267.0	0.470	.638	638	.047
	NOTEQ	55	48.96					
Non-word decoding	EQ	44	53.75	1375.0	0.798	.072	.288	.182
	NOTEQ	54	46.04					
Oral passage reading	EQ	44	54.23	1396.0	1.800	.072	.288	.182
	NOTEQ	55	46.62					
Reading com-prehension	EQ	44	55.06	1432.5	2.997	.003	.015	.303
	NOTEQ	55	45.95					
Listening comprehen-sion	EQ	44	64.95	1868.0	4.954	<.001	.006	.500
	NOTEQ	54	36.91					

EQ= Home language equal to language of instruction   , NOTEQ= Home language not same as language of instruction.
* Standard binomial requirement: n(p) and n(1−p) must both be equal to or greater than 5.
 ** p_{adj} adjustment was done with R to avoid Type I error by following the Holm procedure (1979). In case of p<.001, the calculation was done with the p-value of .0005
*** r= z/ (√N) (Field, 2009), Cohen (1992): Effect size (*r*): .1≤ *r* <.3 small, .3≤ *r* <.5 medium, *r* ≥.5 large effects

Overall, results show significant differences only in Silozi focusing home language for reading instruction in reading comprehension with medium effect size and listening comprehension with large effect size.

6.1.3   Comparison of reading skills between boys and girls in PRP

In Cinyanja, the Mann Whitney non-parametric test results show that there were no significant differences in mean rank scores between genders in all research variables. Table 17 shows the differences between boys and girls in Cinyanja.

TABLE 17 Comparison of boys' (B) and girls'(G) scores in Cinyanja in PRP

		N	Mean rank score	Mann Whitney U	Std. test (z)	Sig.	p_{adj}**	r ***
Orientation to print	B	50	50.39	1205.5	-0.203	.839	1.0	-.020
	G	49	49.60					
Letter-sound knowledge	B	50	50.31	1209.5	-0.113	.910	1.0	-.011
	G	49	49.68					
Non-word decod-ing	B	50	54.64	993.0	-2.070	.038	.192	-.208
	G	49	45.27					
Oral passage read-ing	B	50	54.30	1010.0	-1.850	.064	.256	-.186
	G	49	45.61					
Reading compre-hension	B	50	52.89	1080.5	-1.581	.114	..342	-.159
	G	49	47.05					
Listening compre-hension	B	50	55.86	932.0	-2.141	.032	.192	-.215
	G	49	44.02					

* Standard binomial requirement: n(p) and n(1−p) must both be equal to or greater than 5.
** p_{adj} adjustment was done with R to avoid Type I error by following the Holm procedure (1979). In case of p<.001, the calculation was do with the p-value of .0005
*** r= z/ (√N) (Field, 2009), Cohen (1992): Effect size (*r*): .1≤ *r* <.3 small, .3≤ *r* <.5 medium, *r* ≥.5 large effects

Comparing reading skills between boys and girls in Icibemba in PRP, results showed non-significant differences in mean rank scores in all variables. Table 18 shows the differences between boys and girls in Icibemba.

TABLE 18 Comparison of boys'(B) and girls'(G) scores in Icibemba in PRP

		N	Mean rank score	Mann Whitney U	Std. test (z)	Sig.	p_{adj}**	r ***
Orientation to print	B	52	46.86	1385.5	1.209	.227	.908	.122
	G	47	53.48					
Letter-sound knowledge	B	52	47.85	1334.0	0.796	.426	1.0	.08
	G	47	52.38					
Non-word decod-ing	B	52	49.23	1262.0	0.408	.683	1.0	.041
	G	47	50.85					
Oral passage rea-ding	B	52	50.60	1191.0	-.339	.735	1.0	-.034
	G	47	49.34					
Reading compre-hension	B	52	52.15	1110.0	-1.767	.077	.385	-.178
	G	47	47.62					
Listening compre-hension	B	52	55.39	941.5	-2.025	.043	.258	-.204
	G	47	44.03					

* Standard binomial requirement: n(p) and n(1−p) must both be equal to or greater than 5.
** p_{adj} adjustment was done with R to avoid Type I error by following the Holm procedure (1979). In case of p<.001, the calculation was done with the p-value of .0005
*** r= z/ (√N) (Field, 2009), Cohen (1992): Effect size (*r*): .1≤ *r* <.3 small, .3≤ *r* <.5 medium, *r* ≥.5 large effects

In a comparison of reading skills for boys and girls in Kiikaonde in PRP, results showed again non-significant differences in mean rank scores in all test variables. Table 19 shows the test results between boys and girls in Kiikaonde.

TABLE 19 Comparison of boys' (B) and girls' (G) scores in Kiikaonde in PRP

		N	Mean rank score	Mann Whitney U	Std. test (z)	Sig.	p_{adj}**	r ***
Orientation to print	B	46	51.41	1016.0	-1.362	.173	1.0	-.139
	G	50	45.82					
Letter-sound knowledge	B	46	48.91	1131.0	-0.145	.884	1.0	-.015
	G	50	48.12					
Non-word decoding	B	46	49.62	1098.5	-0.555	.579	1.0	-.057
	G	50	47.47					
Oral passage reading	B	46	48.05	1124.5	-0.039	.969	1.0	.073
	G	49	47.95					
Reading comprehension	B	46	47.00	1173.0	0.711	.477	1.0	.073
	G	49	48.94					
Listening comprehension	B	46	49.82	1089.5	-0.462	.644	1.0	-.047
	G	50	47.29					

* Standard binomial requirement: n (p) and n (1−p) must both be equal to or greater than 5.
 ** p_{adj} adjustment was done with R to avoid Type I error by following the Holm procedure (1979). In case of p<.001, the calculation was done with the p-value of. .0005
*** r= z/ (√N) (Field, 2009), Cohen (1992): Effect size (*r*): .1≤ *r* <.3 small, .3≤ *r* <.5 medium, *r* ≥.5 large effects

When comparing reading skills for boys and girls in Silozi in PRP, results showed no significant differences in all variables. Table 20 shows the differences between boys and girls in Silozi.

TABLE 20   Comparison of boys' (B) and girls'(G) scores in Silozi in PRP

		N	Mean rank score	Mann Whitney U	Std. test (z)	Sig.	p_{adj}**	r ***
Orientation to print	B	49	49.11	1268.5	0.334	.738	1.0	.034
	G	50	50.87					
Letter-sound knowledge	B	49	47.71	1337.0	0.918	.359	1.0	.093
	G	50	52.24					
Non-word decoding	B	48	52.07	1076.5	-1.182	.237	1.0	.119
	G	50	47.03					
Oral passage reading	B	49	51.85	1134.5	-0.870	.384	1.0	-.087
	G	50	48.19					
Reading comprehension	B	49	49.84	1233.0	0.107	.915	1.0	.011
	G	50	50.16					
Listening comprehension	B	48	49.49	1200.5	0.004	.997	1.0	4.04
	G	50	49.51					

* Standard binomial requirement: n (p) and n (1−p) must both be equal to or greater than 5.
        ** p_{adj} adjustment was done with R to avoid Type I error by following the Holm procedure (1979). In case of p<.001, the calculation was done with the p-value of. .0005
*** r= z/ (√N) (Field, 2009), Cohen (1992): Effect size (*r*): .1≤ *r* <.3 small, .3≤ *r* <.5 medium, *r* ≥.5 large effects

Overall results showed no significant differences between boys and girls in all the four languages across all of the variables, in the degree PLP resulted in better scores than PRP.

6.1.4   Summary of Primary Reading Program results

Overall, results for PRP show a higher percentage of zero scorers for all four languages in letter-sound knowledge, non-word decoding, oral passage reading and reading comprehension and high in orientation to print for Icibemba and Silozi. Letter sound knowledge has the lowest percentage of zero scorers within the reading variables with a high percentage of zero scorers. Results show significant differences in favour of learners using home language as the familiar language for reading instruction only in Silozi in reading comprehension with medium effect size and in listening comprehension with large effect size. There are no significant differences between boys and girls in all the four languages in all the variables.

6.2　Primary Literacy Program (PLP)

6.2.1　Percentage of zero scorers in PLP

In order to determine the results of PLP the analysis of zero scorers was made in this study because of huge zero peaks in variables and therefore hypothesis of normality was rejected.

In Cinyanja for PLP, results showed a high percentage of zero scorers in letter-sound knowledge, non-word decoding, oral passage reading and reading comprehension. In Icibemba, for PLP, results showed that the proportion of zero scorers was exceptionally high in non-word decoding, oral passage reading and in reading comprehension. In Kiikaonde, for PLP, results revealed high proportions of zero scorers in letter-sound knowledge, non-word decoding, oral passage reading and reading comprehension. In Silozi, for PLP, results showed a high percentage in letter-sound knowledge, non-word decoding, oral passage reading and in reading comprehension. Table 21 shows the percentage of zero scorers in Cinyanja, Icibemba, Kiikaonde and Silozi

TABLE 21 Proportion of zero scorers in PLP in four languages

	Cinyanja		Icibemba		Kiikaonde		Siilozi	
	N	Percentage of zero scorers	N	Percentage of zero scorers	N	Percentage of zero scorers	N	Percentage of zero scorers
Orientation to print	392	9.7	401	14.2	400	7.0	400	13.5
Letter-sound knowledge	392	25.0	401	13.5	400	20.5	400	37.8
Non-word decoding	392	56.1	401	37.9	400	73.5	400	56.0
Oral passage reading	392	59.4	399	56.6	397	92.2	400	57.5
Reading comprehension	392	72.2	399	77.2	397	84.1	400	70.0
Listening comprehension	391	1.8	401	11.2	400	2.3	400	.3

Overall, for Cinyanja, Kiikaonde and Silozi, results for PLP across four variables show a high percentage of zero scorers in letter sound knowledge, non-word decoding, oral passage reading and reading comprehension, except for Icibemba in which letter-sound knowledge proportion was lower (13.5%). The percentage of zero scorers in letter sounds is highest in Silozi but it has the lowest percentage of zero scorers within the reading variables with a high percentage of zero scorers. Figure 4 shows zero scorers on all six variables in PLP.
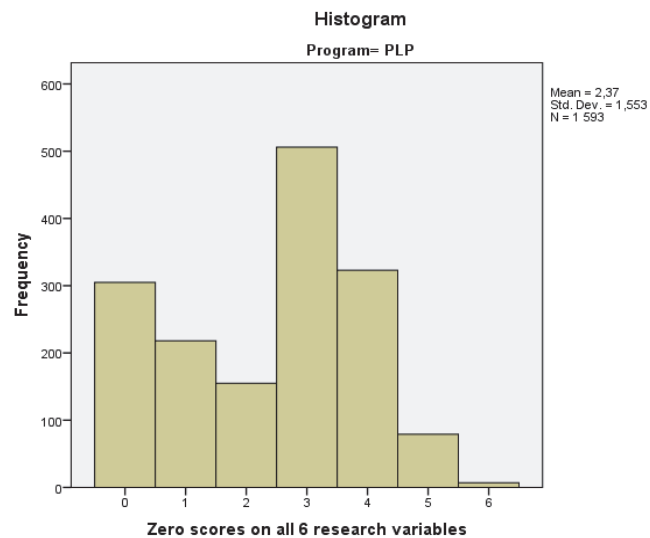
FIGURE 4   Zero scores on all research variables in PLP

6.2.2   Comparison of reading skills between learners using home language as medium of instruction with learners whose home language is different from language of instruction in PLP.

For PLP, results showed that learners who use Cinyanja as home language for reading instruction (EQ) did not differ significantly in mean rank scores in all variables from learners who had home language different from familiar language (NOTEQ). Table 22 shows the test results in Cinyanja.

TABLE 22   Comparing home language groups in PLP in Cinyanja

		N	Mean rank score	Mann Whitney	Std. test (z)	Sig.	p_{adj}**	r ***
Orientation to print	EQ	132	184.19	15535.0	-2.101	.036	.216	-.106
	NOTEQ	260	202.75					
Letter-sound knowledge	EQ	132	185.02	15645.0	-1.441	.150	.600	-.073
	NOTEQ	260	202.33					
Non-word de-coding	EQ	132	195.78	17064.5	-0.099	.921	1.0	-.005
	NOTEQ	260	196.87					
Oral passage reading	EQ	132	199.26	17524.0	0.386	.699	1.0	.019
	NOTEQ	260	195.10					
Reading com-prehension	EQ	132	204.04	18155.5	1.193	.233	.699	.060
	NOTEQ	260	192.67					
Listening com-prehension	EQ	132	211.23	19104.0	1.975	.048	.240	.099
	NOTEQ	259	188.24					

EQ= Home language equal to language of instruction   , NOTEQ= Home language not same as language of instruction.

* Standard binomial requirement: n (p) and n (1−p) must both be equal to or greater than 5.
 ** p_{adj} adjustment was done with R to avoid Type I error by following the Holm procedure (1979). In case of p<.001, the calculation was done with the p-value of. 0005
*** r= z/ (√N) (Field, 2009), Cohen (1992): Effect size (*r*): .1≤ *r* <.3 small, .3≤ *r* <.5 medium, *r* ≥.5 large effects

In Icibemba, results showed that learners who used Icibemba as home language obtained significantly higher mean rank scores in non-word decoding and in oral passage with small effect sizes. Table 23 below shows the differences be-tween home language groups in Icibemba.

TABLE 23   Comparing home language groups in PLP in Icibemba

		N	Mean rank score	Mann Whit-ney	Std. test (z)	Sig.	p_{adj}**	r ***
Orientation to print	EQ	325	205.48	13805.0	1.1846	.065	.195	.059
	NOTEQ	76	181.86					
Letter-sound knowledge	EQ	325	205.83	13921.0	1.730	.084	.195	.086
	NOTEQ	76	180.33					
Non-word decoding	EQ	325	215.08	16925.0	5.176	<.001	<006	.259
	NOTEQ	76	140.80					
Oral passage reading	EQ	323	209.69	15404.0	3.826	<.001	<.006	.192
	NOTEQ	76	158.82					
Reading comprehen-sion	EQ	323	204.98	13881.5	2.422	.015	.060	.121
	NOTEQ	76	178.85					
Listening comprehen-sion	EQ	325	204.85	13601.5	1.407	.159	.195	.070
	NOTEQ	76	184.53					

EQ= Home language equal to language of instruction   , NOTEQ= Home language not same as language of instruction.
* Standard binomial requirement: n(p) and n(1−p) must both be equal to or greater than 5.
 ** p_{adj} adjustment was done with R to avoid Type I error by following the Holm procedure (1979). In case of p<.001, the calculation was done with the p-value of .0005
*** r= z/ ($\sqrt{N}$) (Field, 2009), Cohen (1992): Effect size (*r*): .1≤ *r* <.3 small, .3≤ *r* <.5 medium, *r* ≥.5 large effects

In Kiikaonde results showed that learners who use Kiikaonde as home language obtained significantly higher mean rank scores in listening comprehension with medium size effect. Table 24 shows the test results in Kiikaonde.

TABLE 24   Comparing home language groups in PLP in Kiikaonde

		N	Mean rank score	Mann Whit-ney	Std. test (z)	Sig.	p_{adj}**	r ***
Orientation to print	EQ	252	204.54	19666.5	1.301	.193	.579	.065
	NOTEQ	148	193.62					
Letter-sound knowledge	EQ	252	193.02	16762.5	-1.700	.089	.445	-085
	NOTEQ	148	213.24					
Non-word decod-ing	EQ	252	195.06	17277.0	-1.582	.114	.456	-.079
	NOTEQ	148	209.76					
Oral passage reading	EQ	250	197.98	18120.5	-.496	.620	.994	-.025
	NOTEQ	147	200.73					
Reading compre-hension	EQ	250	197.09	17898.5	-.679	.497	.994	-.034
	NOTEQ	147	202.24					
Listening com-prehension	EQ	252	227.49	25450.0	6.269	<.001	<.006	.313
	NOTEQ	148	154.54					

EQ= Home language equal to language of instruction   , NOTEQ= Home language not same as language of instruction.
* Standard binomial requirement: n(p) and n(1−p) must both be equal to or greater than 5.
 ** p_{adj} adjustment was done with R to avoid Type I error by following the Holm procedure (1979). In case of p<.001, the calculation was done with the p-value of .0005
*** r= z/ (√N) (Field, 2009), Cohen (1992): Effect size (*r*): .1≤ *r* <.3 small, .3≤ *r* <.5 medium, *r* ≥.5 large effects

In Silozi results revealed that learners who use Silozi as home language ob-tained significantly higher mean rank scores again only in in listening compre-hension and with small effect size in favor of test language. Table 25 shows the test results in Silozi.

TABLE 25   Comparing home language groups in PLP in Silozi

		N	Mean rank score	Mann Whitney	Std. test (z)	Sig.	p_{adj}**	r ***
Orientation to print	EQ	369	200.01	5538.5	-.346	.729	.729	-.017
	NOTEQ	31	206.34					
Letter-sound knowledge	EQ	369	202.12	6318.5	.996	.319	.638	.049
	NOTEQ	31	181.18					
Non-word decoding	EQ	369	204.13	7060.5	2.389	.017	.070	.119
	NOTEQ	31	157.24					
Oral passage reading	EQ	369	204.20	7083.0	2.451	.014	.070	.123
	NOTEQ	31	156.52					
Reading com-prehension	EQ	369	202.96	6628.5	1.816	.069	.207	.091
	NOTEQ	31	171.18					
Listening comprehen-sion	EQ	369	205.03	7391.0	2.798	.005	.030	.139
	NOTEQ	31	146.58					

EQ= Home language equal to language of instruction   , NOTEQ= Home language not same as language of instruction.
* Standard binomial requirement: n (p) and n (1−p) must both be equal to or greater than 5.
 ** p_{adj} adjustment was done with R to avoid Type I error by following the Holm procedure (1979). In case of p<.001, the calculation was done with the p-value of .0005
*** r= z/ (√N) (Field, 2009), Cohen (1992): Effect size (r): $.1 \leq r < .3$ small, $.3 \leq r < .5$ medium, $r \geq ...5$ large effects

Overall results showed that there were significant differences in using home language for reading instruction compared to not using home language in non-word decoding and oral passage reading in Icibemba with small effect sizes. In Kiikaonde there were differences in listening comprehension with medium ef-fect size and for Silozi, in listening comprehension, with small effect size.

6.2.3   Reading skills between boys and girls in PLP

When comparing reading skills between boys and girls in Cinyanja in PLP, re-sults showed that there were no significant differences in any variable. Table 26 shows the differences and the test results between boys and girls in Cinyanja.

TABLE 26   Comparison of boys' (B) and girls'(G) scores in Cinyanja in PLP

		N	Mean rank score	Mann Whitney	Std. test (z)	Sig.	p_{adj}**	r ***
Orientation to print	B	190	196.98	19098.0	-0.112	.910	.910	-.006
	G	202	196.04					
Letter-sound knowledge	B	190	204.89	17595.0	-1.434	.151	.453	-.072
	G	202	188.60					
Non-word decoding	B	190	203.57	17846.0	-1.321	.186	.453	-.067
	G	202	189.85					
Oral passage reading	B	190	205.21	17535.5	-1.660	.097	.388	-.084
	G	202	188.31					
Reading comprehension	B	190	206.77	17238.5	-2.211	.027	.135	-.111
	G	202	186.84					
Listening comprehension	B	190	210.78	16287.0	-2.610	.009	.054	-.132
	G	201	182.03					

* Standard binomial requirement: n (p) and n (1−p) must both be equal to or greater than 5.
** p_{adj} adjustment was done with R to avoid Type I error by following the Holm procedure (1979). In case of p<.001, the calculation was done with the p-value of .0005
*** r= z/ (√N) (Field, 2009), Cohen (1992): Effect size (*r*): .1≤ *r* <.3 small, .3≤ *r* <.5 medium, *r* ≥.5 large effects

When comparing reading skills between boys and girls in Icibemba in PLP, results showed no significant differences in any variable. Table 27 shows the test results between boys and girls in Icibemba.

TABLE 27   Comparison of boys' (B) and girls' (G) scores in Icibemba in PLP

		N	Mean rank score	Mann Whitney	Std. test (z)*	Sig.	p_{adj}**	r***
Orientation to print	B	203	200.98	20100.5	.003	.997	1.0	.000
	G	198	201.02					
Letter-sound knowledge	B	203	192.28	21868.0	1.529	.126	.756	.076
	G	198	209.94					
Non-word decoding	B	203	198.59	20587.0	.435	.664	1.0	.022
	G	198	203.47					
Oral passage reading	B	202	200.11	19875.0	-.021	.983	1.0	-.001
	G	197	199.89					
Reading comprehension	B	202	201.61	19572.0	-.385	.701	1.0	-.019
	G	197	198.35					
Listening comprehension	B	203	203.08	19675.5	-.372	.710	1.0	-.019
	G	198	198.87					

* Standard binomial requirement: n (p) and n (1−p) must both be equal to or greater than 5.
** p_{adj} adjustment was done with R to avoid Type I error by following the Holm procedure (1979). In case of p<.001, the calculation was done with the p-value of .0005
*** r= z/ (√N) (Field, 2009), Cohen (1992): Effect size (*r*): .1≤ *r*<.3 small, .3≤ *r*<.5 medium, *r* ≥.5 large effects

When comparing reading skills between boys and girls in Kiikaonde in PLP, results revealed no significant differences in all variables. Table 28 shows the test results between boys and girls in Kiikaonde.

TABLE 28   Comparison boys' (B) and girls'(G) scores in Kiikaonde in PLP

		N	Mean rank score	Mann Whitney	Std. test (z)	Sig.	p_{adj}**	r ***
Orientation to print	B	200	210.46	18008.0	-2.457	.014	.084	.123
	G	200	190.54					
Letter-sound knowledge	B	200	207.06	18687.0	-1.143	.253	.672	-.050
	G	200	193.94					
Non-word decoding	B	200	205.00	19100.5	-1.002	.316	.672	-.050
	G	200	196.00					
Oral passage reading	B	197	204.75	18566.5	-2.131	.033	.165	-.107
	G	200	193.33					
Reading comprehension	B	197	203.48	18816.5	-1.217	.224	.672	-.061
	G	200	194.58					
Listening comprehension	B	200	210.72	17966.0	-1.819	.069	.276	-.091
	G	200	190.28					

* Standard binomial requirement: n (p) and n (1−p) must both be equal to or greater than 5.
 ** p_{adj} adjustment was done with R to avoid Type I error by following the Holm procedure (1979). In case of p<.001, the calculation was done with the p-value of .0005
*** r= z/ (√N) (Field, 2009), Cohen (1992): Effect size (*r*): .1≤*r*<.3 small, .3≤ *r*<.5 medium, *r* ≥.5 large effects

Comparison reading skills between boys and girls in Silozi in PLP, results showed again no significant differences in all research variables. Table 29 shows the test results between boys and girls in Silozi.

TABLE 29   Comparison of boys' (B) and girls' (G) scores in Silozi in PLP

		N	Mean rank score	Mann Whitney	Std. test (z)	Sig.	p_{adj}**	r ***
Orientation to print	B	49	49.11	1268.5	0 .334	.738	1.0	.034
	G	50	50.87					
Letter-sound knowledge	B	49	47.71	1337.0	0 .918	.359	1.0	.093
	G	50	52.24					
Non-word decoding	B	48	52.07	1076.5	-1.182	.237	1.0	.119
	G	50	47.03					
Oral passage reading	B	49	51.85	1134.5	-0.870	.384	1.0	-.087
	G	50	48.19					
Reading comprehension	B	49	49.84	1233.0	0.107	.915	1.0	.011
	G	50	50.16					
Listening comprehension	B	48	49.49	1200.5	0.004	.997	1.0	
	G	50	49.51					1.0****

* Standard binomial requirement: n (p) and n (1−p) must both be equal to or greater than 5.
 ** p_{adj} adjustment was done with R to avoid Type I error by following the Holm procedure (1979). In case of p<.001, the calculation was done with the p-value of .0005
*** r= z/ (√N) (Field, 2009), Cohen (1992): Effect size (*r*): .1≤ *r*<.3 small, .3≤ *r*<.5 medium, *r* ≥.5 large effects
****counted *r*=4.04, but replaced with 1.0 because it is the maximum score of *r*

In summary results showed no significant differences between boys and girls in any of the four languages in any variable.

6.2.4   Summary of Primary Literacy Program (PLP) results

The percentage of zero scorers was high in letter-sound knowledge, non-word decoding, oral passage reading and reading comprehension. Letter-sound sound knowledge was lowest among variables with a higher percentage of zero scorers in all four languages. Results revealed significant differences in favour of learners who use home language in the school as familiar language in Icibemba in non-word decoding and oral passage reading with small effect sizes, in Kiikaonde listening comprehension with medium effect size and in Silozi listening comprehension with small effect size. Comparisons of differences between boys' and girls' results showed no significant differences in Cinyanja, Icibemba, Kiikaonde and Silozi across all six research variables.

6.3   Results for comparison of PRP with PLP

In this research design, missing data was found in oral passage reading and reading comprehension variables. These were cases deleted because of incorrect tests. The effect sizes (*r*) of the results were produced according to Field et al. (2012) and were interpreted according to Cohen's (1992) recommendations as small when *.1*≤ *r* <.3, medium when *.3*≤ *r* <.5 and large when r ≥.5. The mean

rank scores were compared with Mann-Whitney U non-parametric tests. Both Primary Reading Program and Primary Literacy Program had similar distributional features.

6.3.1 Percentage of zero scorers in PRP and PLP

The high number of zero scorers limited the selection of analysis methods. The number of zero scorers was high in both the Primary Reading Program and the Primary Literacy Program, except for orientation to print and listening comprehension.

Describing percentages of zero scores by language, results showed a higher percentage of zero scorers for PRP than PLP in Icibemba, Kiikaonde and Silozi in all variables, except in Cinyanja in listening comprehension where PLP had higher percentage than PRP. In both PRP and PLP the percentage of zero scorers was high in letter-sound knowledge, non-word reading, oral passage reading and reading comprehension, except for Icibemba and Silozi which had a high percentage of zero scorers in orientation to print. Table 30 shows zero scorers for each of the programs.

TABLE 30   Zero scorers by programs in four languages

	Program	Cinyanja		Icibemba		Kiikaonde		Silozi	
		N	Percentage of zero scorers	N	Percentage of zero scorers	N	Percentage of zero scorers	N	Percentage of zero scorers
Orientation to print	PRP	99	8.1	99	30.3	96	13.5	99	23.2
	PLP	392	9.7	401	14.2	400	7.0	400	13.5
Letter-sound knowledge	PRP	99	42.4	99	29.3	96	42.7	99	64.6
	PLP	392	25.0	401	13.5	400	20.5	400	37.8
Non-word decoding	PRP	99	72.7	99	80.8	96	81.3	98	76.5
	PLP	392	56.1	401	37.9	400	73.5	99	1.0
Oral passage reading	PRP	99	69.7	99	83.8	95	91.6	99	77.8
	PLP	392	59.4	399	56.6	397	92.2	400	57.5
Reading comprehension	PRP	99	83.8	99	92.9	95	91.6	99	89.9
	PLP	392	72.2	399	77.2	397	84.1	397	84.1
Listening comprehension	PRP	99	1.0	99	7.1	96	5.2	98	8.2
	PLP	391	1.8	401	11.0	400	2.3	400	.3

6.3.2 Comparison of PRP and PLP in each language

Comparison of the learners' reading skills was done in each test language separately because we could not control the possible language effect that might have arisen after transforming the test in Icibemba to the other three test languages. There was no Multi-Group Confirmatory Factor Analysis (MGCFA) for Icibemba and the other languages. To avoid Type I error, the p-values were adjusted

with Holm procedure (1979). The procedure was selected because it generally has more power than Bonferroni.

In Cinyanja, results showed that learners in PLP obtained significantly higher mean rank scores in letter-sound knowledge and non-word decoding. The corresponding effects were small. Overall, the results could be interpreted as weakly supporting PLP in Cinyanja. Table 31 shows the differences between the PRP and PLP in Cinyanja.

TABLE 31   Comparison of PRP and PLP scores in Cinyanja

	Program	N	Mean rank score	Mann Whitney U	Std. test (z)	Sig.	p_{adj}**	r ***
Orientation to print	PRP	99	253.86	18626.0	-.858	.391	.391	-.038
	PLP	392	244.02					
Letter-sound knowledge	PRP	99	193.64	24587.5	4.159	<.001	.006	.187
	PLP	392	259.22					
Non-word decoding	PRP	99	211.96	22774.0	3.007	.003	.015	.135
	PLP	392	254.60					
Oral passage reading	PRP	99	222.87	21693.5	2.072	.038	.128	.094
	PLP	392	251.84					
Reading comprehension	PRP	99	225.12	21471.5	2.147	.032	.128	.097
	PLP	392	251.27					
Listening comprehension	PRP	99	269.04	17024.0	-1.924	.054	.128	-.087
	PLP	391	239.54					

* Standard binomial requirement: n (p) and n (1−p) must both be equal to or greater **than 5.**
 ** p_{adj} adjustment was done with R to avoid Type I error by following the Holm procedure (1979). In case of p<.001, the calculation was done with the p-value of .0005
*** r= z/ (√N) (Field, 2009), Cohen (1992): Effect size (*r*): .1≤ *r* <.3 small, .3≤ *r* <.5 medium, *r* ≥...5 large effects

In Icibemba, results showed that learners in PLP obtained higher mean rank scores in all variables and the differences were significant, except in listening comprehension. The effect sizes were small, and in non-word decoding the effect size was medium. Overall, the results could be interpreted as supporting PLP in Icibemba. Table 32 shows the differences between the PRP and PLP in Icibemba.

TABLE 32   Comparison of PRP and PLP scores in Icibemba

	Program	N	Mean rank score	Mann Whitney	Std. test (z)	Sig.	p_{adj}**	r ***
Orientation to print	PRP	99	200.86	24764.0	4.277	<.001	.006	.194
	PLP	401	262.76					
Letter-sound knowledge	PRP	99	184.82	26351.5	5.065	<.001	.006	.230
	PLP	401	266.71					
Non-word decoding	PRP	99	163.55	28458.0	7.051	<.001	.006	.321
	PLP	401	271.97					
Oral passage reading	PRP	99	192.14	25429.0	5.079	<.001	.006	.231
	PLP	399	263.73					
Reading comprehen- sion	PRP	99	217.65	22903.5	3.548	<.001	.006	.161
	PLP	399	257.40					
Listening comprehen- sion	PRP	99	245.35	20359.0	.405	.685	.685	.018
	PLP	401	251.77					

* Standard binomial requirement: n (p) and n (1−p) must both be equal to or greater than 5.
 ** p_{adj} adjustment was done with R to avoid Type I error by following the Holm procedure (1979). In case of p<.001, the calculation was done with the p-value of .0005
*** r= z/ (√N) (Field, 2009), Cohen (1992): Effect size (*r*): .1≤ *r* <.3 small, .3≤ *r* <.5 medium, *r* ≥...5 large effects

When comparing the reading skills of learners in Kiikaonde, results showed that learners in PLP obtained significantly higher mean rank scores only in letter-sound knowledge with small effect size. Overall, the results could be interpreted as very weakly supporting PLP in Kiikaonde. Table 33 shows the differences between PRP and PLP in Kiikaonde.

TABLE 33   Comparison of PRP and PLP scores in Kiikaonde

	Program	N	Mean rank score	Mann Whitney	Std. test (z)	Sig.	p_{adj}**	r ***
Orientation to print	PRP	96	243.19	19709.5	.573	.567	1.0	.026
	PLP	400	249.77					
Letter-sound knowledge	PRP	96	199.32	23921.0	3.780	<.001	<.006	.172
	PLP	400	260.30					
Non-word de-coding	PRP	96	234.69	20526.0	1.383	.167	.668	.063
	PLP	400	251.82					
Oral passage reading	PRP	95	248.26	18690.5	-.286	.775	1.0	-.013
	PLP	397	246.08					
Reading com-prehension	PRP	95	232.97	20142.5	1.690	.091	.455	.077
	PLP	397	249.74					
Listening com-prehension	PRP	96	246.25	19416.0	.176	.860	1.0	.039
	PLP	400	249.04					

* Standard binomial requirement: n (p) and n (1−p) must both be equal to or greater than 5.
 ** p_{adj} adjustment was done with R to avoid Type I error by following the Holm procedure (1979). In case of p<.001, the calculation was done with the p-value of .0005
*** r= z/ (√N) (Field, 2009), Cohen (1992): Effect size (*r*): .1≤ *r* <.3 small, .3≤ *r* <.5 medium, *r* ≥.5 large effects

Comparing the reading levels of learners in Silozi, results showed that learners in PLP obtained significantly higher mean rank scores in all variables. All effect sizes were small. Overall, the results for Silozi could be interpreted as supporting PLP. Table 34 shows the effects of PRP and PLP in Silozi.

TABLE 34   Comparison of PRP and PLP scores in Silozi

		N	Mean rank score	Mann Whitney	Std. test (z)	Sig.	p_{adj}**	r ***
Orientation to print	PRP	99	222.61	22512.0	2.451	.014	.014	.111
	PLP	400	256.78					
Letter-sound knowledge	PRP	99	188.36	25902.5	4.954	<.001	<.006	.225
	PLP	400	265.26					
Non-word decoding	PRP	98	205.03	23958.0	3.857	<.001	<.006	.175
	PLP	400	260.40					
Oral passage reading	PRP	99	203.80	24374.0	4.066	<.001	<.006	.185
	PLP	400	261.44					
Reading comprehen-sion	PRP	99	209.52	23808.0	4.047	<.001	<.006	.184
	PLP	400	260.02					
Listening compre-hension	PRP	98	196.22	24821.0	4.210	<.001	<.006	.191
	PLP	400	262.55					

* Standard binomial requirement: n (p) and n (1−p) must both be equal to or greater than 5.
 ** p_{adj} adjustment was done with R to avoid Type I error by following the Holm procedure (1979). In case of p<.001, the calculation was done with the p-value of .0005
*** r= z/ (√N) (Field, 2009), Cohen (1992): Effect size (*r*): .1≤ *r* <.3 small, .3≤ *r* <.5 medium, *r* ≥.5 large effects

Overall results for PRP and PLP were in favour of PLP in Cinyanja only in two variables in letter-sound knowledge and non-word decoding and in Kiikaonde only in one variable in letter-sound knowledge. In Silozi results were in favour of PLP in all variables and in Icibemba in all variables except reading comprehension.

6.3.3 Home language comparison

6.3.3.1 Comparisons between the programs when home language was same as the language of instruction

Comparison of the differences between the two programs when home language was equal to language of instruction was carried out using Mann Whitney nonparametric tests in Cinyanja, Icibemba, Kiikaonde and Silozi. The result was as follows.

Comparing levels of reading skills in Cinyanja, results showed that learners who were using Cinyanja as home language for reading instruction in PLP obtained higher mean rank scores with significant differences in letter-sound knowledge, non-word decoding and in reading comprehension with small effect sizes. Table 35 shows the effects of using home language in PRP and PLP in Cinyanja.

TABLE 35   Home language equals language of instruction – Comparing programs in Cinyanja

	Program	N	Mean rank score	Mann Whitney	Std. test (z)*	Sig.	p_{adj}**	r ***
Orientation to print	PRP	77	112.23	4525.0	-1.756	.079	.158	-.122
	PLP	132	100.78					
Letter-sound knowledge	PRP	77	88.08	6385.0	3.141	.002	.012	.217
	PLP	132	114.87					
Non-word decoding	PRP	77	91.70	6106.0	2.777	.005	.025	.192
	PLP	132	112.76					
Oral passage reading	PRP	77	95.66	5801.0	1.971	.049	.147	.136
	PLP	132	110.45					
Reading comprehension	PRP	77	94.40	5898.0	2.555	.011	.044	.177
	PLP	132	111.18					
Listening comprehension	PRP	77	110.16	4684.5	-0.982	.326	.326	.068
	PLP	132	101.99					

* Standard binomial requirement: n (p) and n (1−p) must both be equal to or greater than 5.
 ** p_{adj} adjustment was done with R to avoid Type I error by following the Holm procedure (1979). In case of p<.001, the calculation was done with the p-value of .0005
*** r= z/ (√N) (Field, 2009), Cohen (1992): Effect size (*r*): .1≤ *r* <.3 small, .3≤ *r* <.5 medium, *r* ≥.5 large effects

Comparing levels of reading skills in Icibemba, results showed that learners who use Icibemba as a home language for reading instruction in PLP obtained higher mean rank scores in all variables. The difference was significant in orientation to print, letter-sound knowledge, oral passage reading and reading comprehension with small effect sizes and in non-word decoding with a medium effect size. Table 36 shows the effects of using home language in PRP and PLP in Icibemba.

TABLE 36 Home language equals language of instruction – Comparing programs in Icibemba

	Program	N	Mean rank score	Mann Whit-ney	Std. test (z)*	Sig.	p_{adj}**	r ***
Orientation to print	PRP	99	168.82	20412.0	4.564	<.001	<.003	.223
	PLP	325	225.81					
Letter-sound knowledge	PRP	99	156.12	29669.5	5.244	<.001	<.003	.255
	PLP	325	229.68					
Non-word decoding	PRP	99	130.82	24174.0	7.894	<.001	<.003	.383
	PLP	325	237.38					
Oral passage reading	PRP	99	157.80	21305.0	5.654	<.001	<.003	.276
	PLP	323	227.96					
Reading comprehen-sion	PRP	99	181.92	18917.0	3.889	<.001	<.003	.189
	PLP	323	230.57					
Listening comprehen-sion	PRP	99	205.12	16818.0	0.700	.484	.484	.034
	PLP	325	214.75					

* Standard binomial requirement: n (p) and n (1−p) must both be equal to or greater than 5.
 ** p_{adj} adjustment was done with R to avoid Type I error by following the Holm procedure (1979). In case of p<.001, the calculation was done with the p-value of .0005
*** r= z/ (√N) (Field, 2009), Cohen (1992): Effect size (*r*): .1≤ *r* <.3 small, .3≤ *r* <.5 medium, *r* ≥.5 large effects

Comparing levels of reading skills in Kiikaonde, results showed that learners who use Kiikaonde as home language for reading instruction in PLP obtained significantly higher mean rank scores only in letter-sound knowledge with small effect size. Table 37 shows the effects of using home language in PRP and PLP in Kiikaonde.

TABLE 37   Home language equals language of instruction – Comparing programs in Kiikaonde

	Program	N	Mean rank score	Mann Whitney	Std. test (z)*	Sig.	p_{adj}**	r ***
Orientation to print	PRP	91	165.88	12022.5	0 .993	.321	.963	.054
	PLP	252	174.21					
Letter-sound knowledge	PRP	91	146.05	13827.0	2.948	.003	.018	.160
	PLP	252	181.37					
Non-word decoding	PRP	91	166.29	11986.0	0 .878	.380	.963	.047
	PLP	252	174.06					
Oral passage reading	PRP	91	173.18	11176.5	-0.536	.592	.963	-.029
	PLP	250	170.21					
Reading comprehension	PRP	91	164.16	11997.0	1.314	.189	.756	.071
	PLP	250	173.49					
Listening comprehension	PRP	91	152.14	13273.0	2.314	.021	.105	.125
	PLP	252	179.17					

* Standard binomial requirement: n (p) and n (1−p) must both be equal to or greater than 5.
 ** p_{adj} adjustment was done with R to avoid Type I error by following the Holm procedure (1979). In case of p<.001, the calculation was done with the p-value of .0005
*** r= z/ (√N) (Field, 2009), Cohen (1992): Effect size (*r*): .1≤ *r* <.3 small, .3≤ *r* <.5 medium, *r* ≥.5 large effects

Comparing levels of reading skills in Silozi, results showed that learners who use Silozi as home language for reading instruction in PLP obtained significantly higher mean rank scores again only in letter-sound knowledge with small effect size. Table 38 shows the effects of using Silozi as the home language in PRP and PLP.

TABLE 38   Home language equals language of instruction – Comparing programs I Silozi

	Pro-gram	N	Mean rank score	Mann Whit-ney	Std. test (z)*	Sig.	p_{adj}**	r ***
Orientation to print	PRP	44	198.98	8471.0	0.556	.578	1.0	.028
	PLP	369	207.96					
Letter-sound knowledge	PRP	44	154.77	10416.0	3.176	.001	.006	.159
	PLP	369	213.23					
Non-word de-coding	PRP	44	177.91	9398.0	1.881	.060	.240	.094
	PLP	369	210.47					
Oral passage reading	PRP	44	175.53	9502.5	2.051	.040	.200	.103
	PLP	369	210.75					
Reading compre-hension	PRP	44	185.33	9071.5	1.573	.116	.348	.079
	PLP	369	209.58					
Listening com-prehension	PRP	44	212.00	7898.0	-0.304	.761	1.0	-.015
	PLP	369	206.40					

* Standard binomial requirement: n (p) and n (1−p) must both be equal to or greater than 5.
 ** p_{adj} adjustment was done with R to avoid Type I error by following the Holm procedure (1979). In case of p<.001, the calculation was done with the p-value of .0005
*** r= z/ (√N) (Field, 2009), Cohen (1992): Effect size (r): .1≤ r <.3 small, .3≤ r <.5 medium, r ≥.5 large effects

Overall results showed that learners using home language for reading instruction results showed significant differences in Cinyanja in letter-sound knowledge, non-word decoding and reading comprehension with small effect sizes. In Icibemba the significant difference occured in letter-sound knowledge, orientation to print, oral passage reading and reading comprehension with small effect sizes and in non-word decoding with medium effect size. Kiikaonde and Silozi showed significant letter-sound knowledge differences with small effect size. Overall, even though the effects were small, results significantly favoured PLP phonics-based approach in all languages in letter-sound knowledge and this means PLP has a better approach for teaching letter-sound knowledge than PRP when the learners home language was equal to familiar language.

6.3.3.2   Comparison between the programs when home language was not equal to the language of instruction

Comparison of the differences between the two programs where home language was not equal to language of instruction was carried out using Mann Whitney non-parametric test results in Cinyanja, Kiikaonde and Silozi. In Icibemba there were no learners in PRP program under current condition and this comparison between the programs could not be done. The following were the results.

Comparing levels of reading skills in Cinyanja between PLP and PRP, results showed that learners not using Cinyanja as their home language obtain higher mean rank scores in PLP on all variables except in listening comprehen-

sion. However, the differences were not significant and the effect sizes were less than small. Table 39 shows the effects of the difference between the programs on learners not using the test language as their home language.

TABLE 39   home languages not equal to language of instruction – Comparing programs in Cinyanja

	Program	N	Mean rank score	Mann Whit-ney	Std. test (z)	Sig.	p_{adj}**	r ***
Orientation to print	PRP	22	138.41	2928.0	0 .268	.789	1.0	.016
	PLP	260	141.76					
Letter-sound knowledge	PRP	22	122.36	3281.0	1.157	.247	1.0	.068
	PLP	260	143.12					
Non-word decoding	PRP	22	130.11	3110.5	0 .759	.448	1.0	.045
	PLP	260	142.46					
Oral passage reading	PRP	22	133.07	3045.5	0 .572	.568	1.0	.034
	PLP	260	142.21					
Reading comprehen-sion	PRP	22	138.61	2923.5	0.225	.822	1.0	.013
	PLP	260	141.74					
Listening comprehen-sion	PRP	22	148.20	2690.5	-0.449	.653	1.0	-.026
	PLP	259	140.39					

* Standard binomial requirement: n (p) and n (1−p) must both be equal to or greater than 5.
 ** p_{adj} adjustment was done with R to avoid Type I error by following the Holm procedure (1979). In case of p<.001, the calculation was done with the p-value of .0005
*** r= z/ (√N) (Field, 2009), Cohen (1992): Effect size (*r*): .1≤ *r* <.3 small, .3≤ *r* <.5 medium, *r* ≥.5 large effects

Comparing levels of reading skills in Kiikaonde, results showed that when learners were not using Kiikaonde as their home language, the differences between the programs were non-significant in all variables and results showed less than small effect sizes in all variables except in letter-sound knowledge where the effect size was small. Table 40 shows the differences between the programs when learners were not using Kiikaonde as their home language.

TABLE 40   Home languages not equal to language of instruction - Comparing the programs in Kiikaonde.

	Program	N	Mean rank score	Mann Whit-ney	Std. test (z)*	Sig.	p_{adj}**	r ***
Orientation to print	PRP	5	81.70	346.5	-0.328	.743	1.0	-.026
	PLP	148	76.84					
Letter-sound knowledge	PRP	5	46.60	522.0	1.568	.117	.702	.126
	PLP	148	78.03					
Non-word decoding	PRP	5	73.20	389.0	0.239	.811	1.0	.019
	PLP	148	77.13					
Oral passage reading	PRP	4	69.50	320.0	0 .619	.536	1.0	.050
	PLP	147	76.18					
Reading comprehen-sion	PRP	4	63.00	346.0	0 .918	.359	1.0	.074
	PLP	147	76.35					
Listening comprehen-sion	PRP	5	97.20	269.0	-1.058	.290	1.0	-.085
	PLP	148	76.32					

* Standard binomial requirement: n (p) and n (1−p) must both be equal to or greater than 5.
 ** p_{adj} adjustment was done with R to avoid Type I error by following the Holm procedure (1979). In case of p<.001, the calculation was done with the p-value of .0005
*** r= z/ (√N) (Field, 2009), Cohen (1992): Effect size (*r*): .1≤ *r* <.3 small, .3≤ *r* <.5 medium, *r* ≥.5 large effects

Comparing levels of reading skills in Silozi, results showed that learners not using Silozi as their home language in PLP obtained higher mean rank scores on all variables. The differences between the programs were significant only in listening comprehension with medium effect size. Table 41 shows differences between the programs when learners were not using Silozi as their home language.

TABLE 41   Home language not equal to language of instruction – Silozi: Comparing the
programs

	Program	N	Mean rank score	Mann Whit-ney	Std. test (z)*	Sig.	p_{adj}**	r ***
Orientation to print	PRP	55	39.77	1057.5	2.022	.043	.129	.225
	PLP	31	50.11					
Letter-sound knowledge	PRP	55	39.34	1081.5	2.282	.022	.088	.254
	PLP	31	50.89					
Non-word decoding	PRP	54	42.02	890.0	0.710	.478	.956	.079
	PLP	31	44.71					
Oral passage reading	PRP	55	44.77	892.5	0.544	.586	.956	.060
	PLP	31	44.79					
Reading comprehen-sion	PRP	55	41.31	973.0	2.454	.014	.070	.273
	PLP	31	47.39					
Listening comprehen-sion	PRP	54	37.54	1132.0	2.756	.006	.006	.306
	PLP	31	52.52					

* Standard binomial requirement: n (p) and n (1−p) must both be equal to or greater than 5.
 ** p_{adj} adjustment was done with R to avoid Type I error by following the Holm procedure
(1979). In case of p<.001, the calculation was done with the p-value of .0005
*** r= z/ (√N) (Field, 2009), Cohen (1992): Effect size (*r*): .1≤ *r* <.3 small, .3≤ *r* <.5 medium, *r*
≥.5 large effects

There was no significant difference in any variable in all the four languages for
learners whose home language was not the same as the language of instruction
between the two programs, except in Silozi in listening comprehension with
significant difference in favour of PLP.

6.3.4   Specific results of gender in PRP and PLP

6.3.4.1   Comparing programs by language of instruction for boys

When comparing levels of reading skills for boys in Cinyanja between PRP and
PLP across six variables, results showed that boys in PLP obtained significantly
higher mean rank scores only in letter-sound knowledge with small effect size.
Table 42 shows the results of Cinyanja for boys in PRP and PLP.

TABLE 42   Comparing the programs in Cinyanja for boys

	Program	N	Mean rank score	Mann Whitney U	**Std. test (z)***	Sig.	p_{adj}**	r ***
Orientation to print	PRP	50	125.02	4524.0	-0.719	.472	.728	-.046
	PLP	190	119.31					
Letter-sound knowledge	PRP	50	94.87	6031.5	2.967	.003	.018	.191
	PLP	190	127.24					
Non-word decoding	PRP	50	109.51	5299.5	1.384	.166	.664	.089
	PLP	190	123.39					
Oral passage reading	PRP	50	113.37	5106.5	0.907	.364	.728	.058
	PLP	190	122.38					
Reading com-prehension	PRP	50	111.51	5199.5	1.268	.205	.664	.082
	PLP	190	122.87					
Listening comprehension	PRP	50	136.49	3950.5	-1.916	.055	.275	-.124
	PLP	190	116.29					

* Standard binomial requirement: n (p) and n (1−p) must both be equal to or greater than 5.
 ** p_{adj} adjustment was done with R to avoid Type I error by following the Holm procedure (1979). In case of p<.001, the calculation was done with the p-value of .0005
*** r= z/ (√N) (Field, 2009), Cohen (1992): Effect size (*r*): .1≤ *r* <.3 small, .3≤ *r* <.5 medium, *r* ≥.5 large effects

When comparing levels of reading skills for boys in Icibemba between PRP and PLP on six variables, results showed that boys in PLP obtained significantly higher mean rank scores in all the variables except in reading comprehension and listening comprehension. The effect sizes were small in orientation to print, letter-sound knowledge and oral passage reading. However, in non-word decoding the effect was medium size. Table 43 shows the differences between the programs in Icibemba for boys.

TABLE 43   Comparing the programs in Icibemba for boys

	Program	N	Mean rank score	Mann Whit-ney	Std. test (z)*	Sig.	p_{adj}**	r ***
Orientation to print	PRP	52	95.5	6968.0	3.952	<.001	<.003	.247
	PLP	203	136.33					
Letter-sound knowledge	PRP	52	95.80	6952.5	3.541	<.001	<.003	.222
	PLP	203	136.25					
Non-word de-coding	PRP	52	83.58	7588.0	5.155	<.001	<.003	.323
	PLP	203	139.38					
Oral passage reading	PRP	52	100.85	6638.0	3.409	.001	.003	.214
	PLP	202	134.36					
Reading com-prehension	PRP	52	114.65	5920.0	1.993	.046	.092	.125
	PLP	202	130.81					
Listening com-prehension	PRP	52	134.40	4945.0	-0.720	.472	.472	-.045
	PLP	203	126.36					

* Standard binomial requirement: n (p) and n (1−p) must both be equal to or greater than 5.
 ** p_{adj} adjustment was done with R to avoid Type I error by following the Holm procedure (1979). In case of p<.001, the calculation was done with the p-value of .0005
*** r= z/ (√N) (Field, 2009), Cohen (1992): Effect size (*r*): .1≤ *r* <.3 small, .3≤ *r* <.5 medium, *r* ≥.5 large effects

When comparing levels of reading skills for boys in Kiikaonde between PRP and PLP on six variables, results showed that boys in PLP obtained significantly higher mean rank scores only in letter-sound knowledge with small effect size. Table 44 shows the test results of Kiikaonde for boys between PRP and PLP.

TABLE 44   Comparing the programs in Kiikaonde for boys

	Program	N	Mean rank score	Mann Whit-ney	Std. test (z)*	Sig.	p_{adj}**	r ***
Orientation to print	PRP	46	122.32	4654.5	0.202	.840	1.0	.013
	PLP	200	123.77					
Letter-sound knowledge	PRP	46	96.77	5829.5	2.849	.004	.024	.182
	PLP	200	129.65					
Non-word de-coding	PRP	46	116.66	4914.5	0 .927	.354	1.0	.059
	PLP	200	125.07					
Oral passage reading	PRP	46	120.20	4614.0	0 .367	.714	1.0	.023
	PLP	197	122.42					
Reading com-prehension	PRP	46	111.09	5033.0	1.851	.064	.320	.119
	PLP	197	124.55					
Listening com-prehension	PRP	46	119.59	4780.0	0 .427	.669	1.0	.027
	PLP	200	124.40					

* Standard binomial requirement: n (p) and n (1−p) must both be equal to or greater than 5.
 ** p_{adj} adjustment was done with R to avoid Type I error by following the Holm procedure (1979). In case of p<.001, the calculation was done with the p-value of .0005
*** r= z/ (√N) (Field, 2009), Cohen (1992): Effect size (*r*): .1≤ *r* <.3 small, .3≤ *r* <.5 medium, *r* ≥.5 large effects

When comparing levels of reading skills for boys in Silozi between PRP and PLP across six variables, results showed that boys in PLP obtained higher mean rank scores on all variables and the differences were significant with small effect sizes. Table 45 shows the effects of Silozi for boys in PRP and PLP.

TABLE 45   Comparing the programs in Silozi for boys

	Program	N	Mean rank score	Mann Whitney	Std. test (z)*	Sig.	p_{adj}**	r ***
Orientation to print	PRP	49	109.57	5705.0	1.967	.049	.049	.124
	PLP	201	129.38					
Letter-sound knowledge	PRP	49	94.76	6431.0	3.510	<.001	<.003	.222
	PLP	201	133.00					
Non-word decoding	PRP	48	105.28	5770.5	2.345	.019	.038	.148
	PLP	201	129.71					
Oral passage reading	PRP	49	103.09	6022.5	2.718	.007	.021	.172
	PLP	201	130.96					
Reading comprehension	PRP	49	101.50	6100.5	3.260	.001	.005	.206
	PLP	201	131.35					
Listening comprehension	PRP	48	95.43	6243.5	3.270	.001	.005	.207
	PLP	201	132.06					

* Standard binomial requirement: n (p) and n (1−p) must both be equal to or greater than 5.
 ** p_{adj} adjustment was done with R to avoid Type I error by following the Holm procedure (1979). In case of p<.001, the calculation was done with the p-value of .0005
*** r= z/ (√N) (Field, 2009), Cohen (1992): Effect size (*r*): .1≤ *r* <.3 small, .3≤ *r* <.5 medium, *r* ≥.5 large effects

Overall results showed significant differences for boys between the two programs favouring PLP in in all languages in letter-sound knowledge with small effect size, and in Silozi on all variables, with small effect sizes. Based on these results boys seemed to benefit clearly more of PLP in letter-sound.

6.3.4.2   Comparing programs by language of instruction for girls

When comparing levels of reading skills for girls in Cinyanja between PRP and PLP on six variables, results showed that girls in PLP obtained significantly higher mean rank scores in letter-sound knowledge and non-word decoding with small effect sizes. Table 46 shows the differences between PRP and PLP in Cinyanja for girls.

TABLE 46   Comparing the programs in Cinyanja for girls

	Program	N	Mean rank score	Mann Whitney	Std. test (z)*	Sig.	p_{adj}**	r ***
Orientation to print	PRP	49	129.36	4784.5	-0.503	.615	.742	-.032
	PLP	202	125.19					
Letter-sound knowledge	PRP	49	99.16	6264.0	2.922	.003	.018	.184
	PLP	202	132.51					
Non-word de-coding	PRP	49	101.99	6125.5	2.979	.003	.018	.188
	PLP	202	131.82					
Oral passage reading	PRP	49	109.05	5779.5	2.145	.032	.128	.135
	PLP	202	130.11					
Reading com-prehension	PRP	49	113.54	5559.5	1.894	.058	.174	.120
	PLP	202	129.02					
Listening com-prehension	PRP	49	133.52	4531.5	-0.895	.371	.742	-.057
	PLP	201	123.54					

* Standard binomial requirement: n (p) and n (1−p) must both be equal to or greater than 5.
 ** p_{adj} adjustment was done with R to avoid Type I error by following the Holm procedure (1979). In case of p<.001, the calculation was done with the p-value of .0005
*** r= z/ (√N) (Field, 2009), Cohen (1992): Effect size (*r*): .1≤ *r* <.3 small, .3≤ *r* <.5 medium, *r* ≥.5 large effects

When comparing levels of reading skills for Icibemba between PRP and PLP in six variables, results showed that girls in PLP obtained significantly higher mean rank scores on all variables except in orientation to print and listening comprehension. The effect sizes were small except in non-word decoding, where the effect size was medium. Table 47 shows the differences between PRP and PLP in Icibemba for girls.

TABLE 47   Comparing the programs in Icibemba for girls

	Program	N	Mean rank score	Mann Whitney	Std. test (z)*	Sig.	p_{adj}**	r ***
Orientation to print	PRP	47	106.53	5427.0	2.007	.045	.090	.128
	PLP	198	126.91					
Letter-sound knowledge	PRP	47	89.17	6243.0	3.650	<.001	<.003	.233
	PLP	198	131.03					
Non-word de-coding	PRP	47	80.39	6655.5	4.815	<.001	<.003	.308
	PLP	198	133.11					
Oral passage reading	PRP	47	91.63	6080.5	3.776	<.001	<.003	.242
	PLP	197	129.87					
Reading com-prehension	PRP	47	103.03	6544.5	3.115	.002	.006	.199
	PLP	197	127.14					
Listening com-prehension	PRP	47	111.05	5214.5	1.316	.188	.188	.084
	PLP	198	125.84					

* Standard binomial requirement: n (p) and n (1−p) must both be equal to or greater than 5.
 ** p_{adj} adjustment was done with R to avoid Type I error by following the Holm procedure (1979). In case of p<.001, the calculation was done with the p-value of .0005
*** r= z/ (√N) (Field, 2009), Cohen (1992): Effect size (*r*): .1≤ *r* <.3 small, .3≤ *r* <.5 medium, *r* ≥.5 large effects

When comparing levels of reading skills for girls in Kiikaonde between PRP and PLP in six variables, results showed no significant difference for girls in all the research variables. Table 48 shows the differences between PRP and PLP in Kiikaonde for girls.

TABLE 48   Comparing the programs in Kiikaonde for girls

	Program	N	Mean rank score	Mann Whit-ney	Std. test (z)*	Sig.	p_{adj}**	r ***
Orientation to print	PRP	50	121.96	5177.0	0.503	.615	1.0	.031
	PLP	200	126.38					
Letter-sound knowledge	PRP	50	103.46	6102.0	2.436	.015	.09	.154
	PLP	200	131.01					
Non-word de-coding	PRP	50	118.17	5366.5	1.084	.279	1.0	.069
	PLP	200	127.33					
Oral passage reading	PRP	49	128.45	4731.0	-0.937	.349	1.0	-.059
	PLP	200	124.16					
Reading com-prehension	PRP	49	122.14	5040.0	0.526	.599	1.0	.033
	PLP	200	125.70					
Listening com-prehension	PRP	50	127.17	4916.5	-0.188	.851	1.0	-.012
	PLP	200	125.08					

* Standard binomial requirement: n (p) and n (1−p) must both be equal to or greater than 5.
 ** p_{adj} adjustment was done with R to avoid Type I error by following the Holm procedure (1979). In case of p<.001, the calculation was done with the p-value of .0005
*** r= z/ (√N) (Field, 2009), Cohen (1992): Effect size (*r*): .1≤ *r* <.3 small, .3≤ *r* <.5 medium, *r* ≥.5 large effects

When comparing the levels of reading skills for girls in Silozi between PRP and PLP in six variables, results showed that girls in PLP obtained higher mean rank scores in all variables with significant difference except in orientation to print. The significances were with small effect sizes. Table 49 shows the test results between PRP and PLP in Silozi for girls.

TABLE 49   Comparing the programs in Silozi for girls

	Program	N	Mean rank score	Mann Whit-ney	Std. test (z)*	Sig.	p_{adj}**	r ***
Orientation to print	PRP	50	113.47	5551.5	1.494	.135	.135	.095
	PLP	199	127.90					
Letter-sound knowledge	PRP	50	93.86	6532.0	3.527	<.001	<.003	.224
	PLP	199	132.82					
Non-word decoding	PRP	50	100.66	6192.0	3.078	.002	.010	.195
	PLP	199	131.12					
Oral passage reading	PRP	50	101.33	6158.5	3.023	.003	.012	.192
	PLP	199	130.95					
Reading comprehen-sion	PRP	50	108.39	5805.5	2.449	.014	.028	.155
	PLP	199	129.17					
Listening comprehen-sion	PRP	50	101.49	6150.5	2.652	.008	.008	.168
	PLP	199	130.91					

* Standard binomial requirement: n (p) and n (1−p) must both be equal to or greater than 5.
 ** p_{adj} adjustment was done with R to avoid Type I error by following the Holm procedure (1979). In case of p<.001, the calculation was done with the p-value of .0005
*** r= z/ (√N) (Field, 2009), Cohen (1992): Effect size (*r*): .1≤ *r* <.3 small, .3≤ *r* <.5 medium, *r* ≥.5 large effects

Overall, results showed significant differences for girls between the two programs in Icibemba in letter-sound knowledge, oral passage reading and reading comprehension with small effect sizes and non-word decoding with large effect size. In Silozi, letter-sound knowledge, non-word decoding, oral passage reading and reading comprehension showed small effect sizes and the listening comprehension effect size was medium.

Comparing the differences between the two programs for boys and girls, the results could be interpreted to favour both boys and girls for PLP in letter-sound knowledge in all variables.

6.3.5   Summary of results: Comparisons of PRP and PLP

Test scores showed that there were few learners who scored zero in letter-sound knowledge but were able to read something in oral passage reading. There were few of such cases in Silozi, more in PLP than in PRP, and very few such cases in Cinyanja. Figure 5 shows scatter plots for letter-sound knowledge and oral passage reading in Silozi.
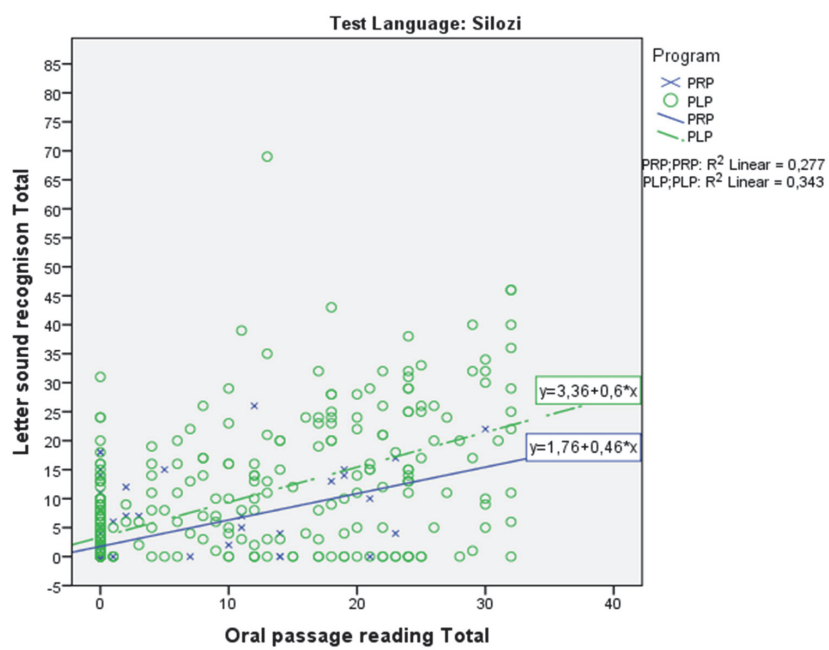
FIGURE 5   Letter-sound knowledge and oral passage reading in Silozi

7 DISCUSSION

7.1 Summary of findings

The finding of this research is that, although initial literacy in familiar language has been implemented by introducing the Primary Reading Program and Primary Literacy Program, comparison of the two programs shows that most children are not yet able to acquire basic reading skills by end of Grade 2 in familiar language, as indicated by the following results.

Comparisons of the differences of the proportion of non-zero scorers between the two programs over all languages revealed higher proportions with PRP (0.084) than PLP (0.192), with significant difference in favour of PLP. Considering the percentage of zero scorers by language in six variables, this research reveals unacceptably high number of zero scorers in both the Primary Reading Program and Primary Literacy Program, except for orientation to print and listening comprehension. In Study I, results for PRP showed a high percentage of zero scorers in Cinyanja, Icibemba, Kiikaonde and Silozi in letter-sound knowledge, non-word decoding, oral passage reading and reading comprehension. The percentages of zero scorers were high in orientation to print in Icibemba and Silozi. Letter-sound knowledge was lowest among all variables but still with a high unacceptable high percentage of zero scorers in all the four languages. Over all languages, in PRP only 33 (8.4%) learners had none zero scores in all six research variables and in five cases learners had all variable scores as zeros. This evidently shows that the levels of zero scorers in second grade were unacceptably high in anyway they are interpreted.

Comparing home language equal or not as the familiar language in PRP in four languages and in six variables, results showed significant differences only in Silozi and in reading comprehension with medium effect size and in listening comprehension with large effect size (with PLP>PRP) in favour of test language as home language. Based on these result it may be claimed that learners having home language the same as the familiar language do not benefit significantly in reading variables compared to learners whose' home language is not the same as familiar language. Learning to read seemed to be equally diffi-

cult for both home language groups. These results were not expected because there is a general belief that use of home language supports well the development of reading skills. However, this research shows that all learners had equal opportunity and were learning equally despite the differences in home language used or not used as medium of instruction for learning to read. There are no significant differences between boys and girls in all the four languages across all the variables in PRP. These results mean that PRP is well designed to support boys and girls equally. Results of Study II showed that overall the percentage of zero scorers in PLP were again unacceptably high in letter-sound knowledge, non-word decoding, oral passage reading and reading comprehension, like in PRP. Zero scorers on all six variables in PLP overall languages, histogram (Figure 4) reveals 305 learners (19.1%) had none zero scores in all variables and only 7 learners scored zero in all variables. The levels of zero scores are again unacceptable high for second graders

When considering levels of reading skills by language on six variables, results for PLP showed a high percentage of zero scorers in letter sound knowledge, non-word decoding, oral passage reading and reading comprehension, except for Icibemba which had lower especially in letter-sound knowledge. This may be due to differences in orthographies where some languages may have some letter-sounds that may be difficult to sound out. For example, in Icibemba sounds *r, z* and *d* (on its own) do not exist but *l* exists. Again, letter-sound knowledge were lowest among reading variables with a higher percentage of zero scorers in all four languages. Comparing reading skills between learners using home language as medium of instruction and learners whose home language is different from language of instruction in four languages across six variables for PLP, revealed significant difference in favour of home language as familiar language in Icibemba in non-word decoding and oral passage reading with small effect sizes, in Kiikaonde, in listening comprehension with medium effect size, and in Silozi, in listening comprehension with small effect size. This means that learners using home language as familiar language scored higher and in this way benefited more than the learners whose home language was different than familiar language. This may be due to home environments where more learners using different home language from language of instruction may be more exposed to some form of reading material or some form of support. Even though learners in samples of this research belonged to rural areas, there could be differences in exposure. In Kiikaonde and Silozi, listening comprehension scores were significantly higher when learner had home language equal to familiar language. Otherwise home language equal group did not benefit significantly. This means that under both programs no children were disadvantaged, both programs were working similarly.

In a comparison of differences in reading skills between boys and girls in the PLP, results showed no significant differences in Cinyanja, Icibemba, Kiikaonde and Silozi across all six research variables. These results mean that, just like PRP, PLP is well designed to support both boys and girls equally.

The findings derived from Study III reviewed that both PRP and PLP showed very high percentages of zero scorers in four languages in six variables except for Oorientation to Pprint and listening comprehension. In general the proportion of zero scorers was unacceptable high in every language and in every research variable. An exception to this was perhaps in Cinyanja in listening comprehension, where the proportions of zero scorers were in PRP 1.0% and in PLP 1.8%. The lowest level 0.3% was found in Silozi PLP listening comprehension. In a comparison of the reading skills in four languages across six variables, results showed significant difference only in three languages, in Cinyanja, in letter-sound knowledge and non-word decoding with small effect sizes, in Icibemba, in orientation to print and letter-sound knowledge with small effect sizes, oral passage reading and reading comprehension with small effect sizes and non-word decoding with medium effect size, and in Kiikaonde, in letter-sound knowledge, with small effect size. In addition, the comparison of the proportions of non-zero scorers in all six variables was done assuming specially in the design that there were no differences between the languages. PRP having 8.4% and PLP having 19.1% non-zero scorers, the difference was significant, with a small effect size in favour of PLP. This result means that PLP produces significantly better results as producing proportionally more non-zero-scorers than PRP over all languages. The difference was significant in letter-sound in all languages. This may be due to PLP focusing more on phonics than PRP. In PLP learners spend close to twenty-six weeks or two terms learning more phonemic awareness and phonics emphasizing letter-sounds for familiar languages than other components of reading. Looking at the differences between PRP and PLP in reading skills in home language and test language, results showed significant differences in favour of PLP for home language being the same as test language in Cinyanja in letter-sound knowledge, non-word decoding and reading comprehension with small effect sizes, in Icibemba, in letter-sound knowledge, orientation to print, oral passage reading and reading comprehension with small effect and non-word decoding with medium effect. In Kiikaonde and Silozi, letter-sound knowledge yielded small effect sizes. Results also showed significant differences in favour of PLP for home language not the same as test language but only in Silozi in listening comprehension with medium effect size. There was no significant difference in all variables in all the four languages for learners whose home language was not the same as the language of instruction between the two programs, except in Silozi in listening comprehension with significant difference in favour of PLP. This means that both PRP and PLP were working similarly to support reading instruction.

Considering the differences between the PRP and PLP in reading skills for boys and girls, results revealed significant differences for boys in Cinyanja and in Kiikaonde in letter-sound knowledge with small effect size, in Silozi in all variables with small effect sizes. Results for girls showed significant differences in Icibemba in letter-sound knowledge, oral passage reading and reading comprehension with small effect sizes and non-word decoding with large effect size. In Silozi, effect sizes were small in letter-sound knowledge, non-word decoding,

oral passage reading and reading comprehension with medium effect size in listening comprehension. In all significant results PLP scored higher. These results mean that both programs were able to address the gender issues and promote equal learning between boys and girls. Girls have been disadvantaged especially in rural areas because they are more engaged in household chores than boys. PLP program scoring higher than PRP means that it is well implemented to support both boys and girls equally.

There were much more significant results in Silozi and Icibemba in all the cases. This may be due to linguistic differences of the languages or the design of the test items. It may also be attributed to testing by different assessors where may be assessors for Icibemba and Silozi may have scored learners differently from the other assessors and that could affect the mean scores

Comparing the two programs, the results of this research may be interpreted as being in favour of the recently implemented PLP program. PLP has placed much emphasis on teaching the basic key components of learning to read, phonemic awareness, phonics, fluency, vocabulary and reading comprehension, and has also placed much emphasis on the phonics approach for teaching reading. However, the significant differences between PRP and PLP demonstrated small effect sizes, but both programs had high proportions of zero scores. Therefore, reading instruction in Zambia still needs to be supported so that children can acquire basic reading skills in familiar language early by the end of Grade 2. This research revealed slightly better results for the PLP than PRP on the basic reading skills, more specifically in letter-sound knowledge and reading skills (non-word reading, oral passage reading and reading comprehension). This means that the program implemented just for two years is promising to improve reading skills in early grades.

7.2   Limitations of the research

The first limitation is the lack of comparability between the test languages. This resulted in restriction to show proportions in the severe case of high peak of zero scorers. Using specific case point of unacceptable level of zero scorers makes the comparison complex and this resulted in simplifying the comparison by using only the zero scorers' distributions. The zero score problem might also be a measurement tool problem since the present EGRA version might have some measuring problems especially in rules that restrict learners to continue reading.

There were some challenges faced during the research. The first limitation was that the research was cross-sectional and therefore we were not able to follow the development of learners. This is because the study was comparing two programs, Primary Reading Program (PRP), where learners were instructed to read for one year and continuing to learn to read during Zambian language lessons in Grade 2, and Primary Literacy Program (PLP) where learners were instructed to read for two years in familiar language. The study was restricted to

only four PRP districts compared to twelve PLP districts. This is because, in 2014 when the assessment was conducted, there were only twelve districts that had learners in Grade 2 following reading instruction for PLP. The twelve districts started piloting PLP in 2013 with support from the Read To Succeed Project. Therefore, the study only unfolds the prevailing situation to determine levels of reading in four familiar languages in Grade 2 at the time when the study was conducted. The results will provoke discussions on implementations aimed at improving reading programs and reading instruction in Zambia.

Also, although the assessors were trained and it was not their first time of working in this role, learners' performance may have been affected by the fact that assessors were not familiar to them and the warming up period was very short. The other limitation is that the assessment test where a stop watch was used was unfamiliar to the children. These things might have caused at least part of the huge proportions of zero scorers.

Another limitation is that the study did not cover details about teachers' skills in teaching familiar languages for PRP and PLP, their home languages, qualifications or fluency of the teachers in the languages they were teaching. It was assumed that since there were many teachers in a school, the requirement was that the Head Teacher should select a teacher who should be able to teach in early grades being a fluent speaker in the language of instruction. In addition, since all teachers were trained through school-based training to teach PRP or PLP, it was assumed that they were able to use familiar language for reading instruction in Grade 1 and 2.

7.3   General overview

This research aimed to establish the levels of reading in familiar language in Zambian schools by end of Grade 2 with the implementation of two literacy programs, Primary Reading Program from 1999 to 2013 and the most recent program, Primary Literacy Program, implemented from 2014. Each of the programs revealed a high percentage of zero scorers in all variables except in orientation to print and listening comprehension. This may be interpreted as an indication that most children were not able to read by end of Grade 2. The two skills with low zero scorers, orientation to print and listening comprehension, did not require children to perform any reading. Attention and oral communication between the assessor and the child was more important. The percentage of non-zero scorers was higher in PLP than in PRP. PRP did not allocate sufficient time for teaching phonics, and one year dedicated for reading instruction in familiar language did not support acquisition of letter-sound knowledge in familiar language by the end of Grade 2.

The hypothesis of the research was that the most recent PLP which is based on five key skills of learning to read (with emphasis on phonics-based approach) can result in better reading skills. However, as cited by Sampa et al. (2016), on general the high numbers of zero scorers in the PLP group indicate

that there are still learners who are not able to perform at all in the EGRA test. In the PLP group, varying by language, 13.5 to 37.8% of children received zero score in letter-sound knowledge, implying that they either were not able to answer at all, or used English letter names which resulted in zero scores. In addition, considering the scoring method of correct/incorrect, it is not possible to say in detail what happened with these zero-scoring children. Letter-sound knowledge in familiar language helps learners to blend syllables and words as they begin to read small units that make up words and sentences. The teaching of letter-sounds has been very problematic as the children have been using letter-names (names of the alphabet) in other subjects where English has been the medium of instruction until 2014. It requires a lot of practice for learners to distinguish letter-sounds from letter-names so that they can read syllables and words. There is a problem of confusion of some of the English letter-names with letter-sounds in Zambian language. Other studies (e.g. Ojanen et. al., 2013) have observed confusing effects of the English letter-names with letter-sounds in Zambian language, e.g. items $/e/$ and $/a/$ and $/i/$. Therefore, any difficulty with the differentiation of the small speech units (phonemes) or letters may manifest as a substantial bottleneck (Lyytinen et al., 2015). In all three studies, there were more zero scorers in non-word decoding, oral passage reading, and reading comprehension than in letter-sound knowledge. This shows that the ability to learn how letters combine to form syllables, words and sentences with meaning, if not well developed in early years, may affect performance in reading connected text with understanding. This is why it is important that teachers use appropriate approaches that promote communication and meaning in familiar language. Children have acquired the language when they come to school but need to understand how writing is connected to the spoken word. Since teachers may be influenced by the English language and are, most of the time, attempting to teach letters of the alphabet instead of letter-sounds for Zambian language, more training and individual practice is required. Teachers who may not be fluent in the Zambian language, may often code switch to English when they are teaching. The other reason could be due to lack of bilingual teaching skills that can enable them to stick to the language they are teaching. Ojanen et al. (2015) has observed that children must be introduced to decoding skills in letter-sounds, syllables and words as early as possible so that from stage they can move to practicing fluency and using literacy to read to learn.

Results of this research showed that comparing Primary Reading Program (PRP) and Primary Literacy Program (PLP), the significant differences between the two programs are in Cinyanja in letter-sound knowledge and non-word decoding with small effect sizes, in Icibemba, in orientation to print and letter-sound knowledge with small effect sizes, oral passage reading and reading comprehension with small effect sizes and non-word decoding with medium effect size, and in Kiikaonde, in letter-sound knowledge with small effect size. Except for Silozi, results revealed significant differences with small effect sizes in favour of PLP, even when learners were introduced to a phonics-based approach that emphasizes the teaching of letter sounds, syllables and words. The

findings showed that differences occur in reading skills acquired by learners in the variables in each language with a general pattern of children doing well in orientation to print and listening comprehension than in reading tasks. An instructional program that will enable learners to blend sounds, form syllables and words and comprehension of meaning of text instructional strategies is required. These results also indicate that children's levels of reading skills differed by language in PRP and PLP. This may be due to linguistic differences among the languages. As observed by Kaani and Joshi (2013) in their comparative study of English and Cinyanja, writing systems are likely to present different challenges based on their word pattern and spelling rules and also due to tone and stress, although both systems are based on the alphabetic writing orthography. The surprising findings of this research can be interpreted in two ways: the children in their reading may have been influenced by English language because in PRP they were introduced to English (SITE course) after one year and in PLP they were introduced to oral English course in the second year. In this research, usually the PLP group had higher mean scores than learners in PRP but with not much difference. This means that PLP is a more promising program. However, because of unacceptably high peak of zero scorers, the programs may simply have failed to enable learners to successfully master the reading skills of the familiar language. Differences in reading between languages may also have occurred in some languages because, since these were rural schools, most of the children may not have been exposed to reading or literature materials before entering school. Most rural homes do not have any reading materials in familiar language, except in some cases the bible.

However, the results indicate that something is happening in the recently implemented program, PLP. This is because, in comparing the two programs, results provide support for PLP districts in all four languages that emphasize the teaching of phonics. One of the concerns in this study is the relation between the scores of letter-sound knowledge and oral passage reading. From the results, one can deduce that there were some children whose scores in the letter-sound knowledge assessment were zero, or close to zero, but who were able to obtain some scores in oral passage reading. One explanation could be that some children may have benefited from blending letter-sounds into syllables and a whole word approach for reading. This may suggest that letter-sound knowledge, though important for reading, may require additional approaches to strengthen the acquisition of reading skills. Goldenberg et al. (2014), from a study conducted in Spanish (a transparent language), show that although letter-sound combinations are taught and how letters are blended to form syllables and words is shown, children need communicative and functional approaches in order to learn to read with understanding. As observed earlier, in all the languages in both PRP and PLP programs, learners performed better in orientation to print and listening comprehension compared to other variables because the task required the assessor to read a short passage and learners listened to the end and answered questions thereafter. All children apply the listening and speaking skills from childhood at home and if they are familiar with a language,

they can be able to answer oral questions. The short time they are in school, by second grade, children being exposed to books may also help them to understand that reading is from left to right top to bottom and in order to begin to read, one has to start at the beginning of a sentence. Therefore, more learners were able to answer questions in orientation to print and listening comprehension than in other variables in both programs. Furthermore, there are fewer zero scorers in these two variables compared to other variables. Overall, results support the recent program PLP in all of the four languages on six variables but the difference were with small effect sizes. This is an indication that the most recent program, PLP, based on a phonics approach if given a lot of support, may enable children in Zambia to read as early as Grade 2 in familiar language.

Comparing PRP and PLP in reading skills in home language, results show significant differences for home language the same as test language in Cinyanja in letter-sound knowledge, non-word decoding and reading comprehension with small effect sizes, in Icibemba in letter-sound knowledge, orientation to print oral passage reading and reading comprehension with small effect and non-word decoding with medium effect and in Kiikaonde and Silozi, letter-sound knowledge with small effect sizes. Therefore, the difference between the two programs was in all languages in letter-sound knowledge... According to Sampa et al. (2016, submitted) although it is sometimes debated in Zambia that the use of regional familiar language may disadvantage children who speak another local language at home, the results show this, in general, is not the case because results from this study show that speaking the language of instruction at home provided reading benefit in only some of the variables and in benefit of PLP. Results also only show significant differences for home language not the same as test language only in Silozi in listening comprehension with medium effect size. This means that both PRP and PLP supported learners in a similar way despite the language background of the children (Sampa et. al., 2016, submitted). Children seem to learn the familiar language quickly from peers or community, even if they do not speak the language at home. According to this study, the failure to learn to read may not be attributed to use of home language that is different from the language of reading instruction. Maybe this can only affect the development of reading skills indirectly due to lack of other factors such as parental participation which can reinforce gaps in learning opportunities between minority and majority groups (Global Education Monitoring report, 2016). Most parents may want to contribute to their children's learning, even if they, themselves, may be illiterate. Chansa-Kabali and Westerholm (2014) in their findings about the role played by family on the acquisition of early reading skills note that, despite lower levels of reading experience or education, parents still influence the reading development of their children through their own reading experiences and attitudes. It is assumed that learners whose language is the same as their home language performed better than learners with different home languages. However, this research did not show significant difference between the two programs for learners using home language for reading instruction. It could be that children, despite being taught in a different lan-

guage, are able to catch up quickly on familiar language through peer interaction.

This research shows that there were no significant differences between boys and girls in each of the programs, PRP and PLP, across all variables in four languages. This could be interpreted that the two programs supported both boys and girls though they are both affected by performance of the programs because of the huge zero scores. PRP and PLP each support boys and girls in reading skills equally. However, there was significant difference between the two programs in some variables; with boys in Cinyanja and in Kiikaonde in letter-sound knowledge, with small effect size, and in Silozi, in all variables with small effect sizes, all cases favouring PLP. Results for girls show significant differences in Icibemba in letter-sound knowledge, oral passage reading and reading comprehension with small effect sizes and non-word decoding with large effect size, in Silozi, in letter-sound knowledge, non-word decoding, oral passage reading and reading comprehension with small effect sizes, and listening comprehension with medium effect size and again favouring PLP. The significant difference in letter-sound knowledge may be associated with non-word decoding, oral passage reading and reading comprehension since it is the basis for learning to read. Results show that, in PLP, boys and girls are slightly better than PRP and especially in Silozi. PLP is evidence of a positive move towards gender parity by the Ministry of General Education. According to the Statistical Bulletin (2012), the dropout rate for females was 2.71% compared to 1.88% for males. This was due to lack of investment in strategies that can motivate and encourage girls to remain in schools. The trend in Zambia now is that girls must be given an opportunity to learn equally as boys so that they can be more productive and contribute to improvement of the social life of their families and the nation as a whole. Therefore, PLP has the potential to develop boys' and girls' reading skills so that they could learn more effectively. Zambia aims to eliminate gender disparities in schools, including in the provision of literacy skills. Therefore, mother-tongue based multilingual education should be supported for girls and women – where language is used both as a bridge for learning and as a source of local knowledge for literacy programs and literacy will enable women to participate in economic, social and political issues (UNESCO, 2012).

Zambia is still searching for an effective literacy program. National statistics on measured outcomes of basic literacy learning in Zambian public schools fall far short of instructional objectives set by the national curriculum (Serpell & Simatende, 2015). This problem can be associated with exposure of teachers to English language that has influenced the teaching of letters of the alphabet instead of the letter-sounds for Zambian languages. Classroom observations showed that teachers code-switch and code-mix to mitigate their own limitations in familiar language and teachers are not able to teach the whole lesson in the target language because of lack of bilingual teaching skills. This has resulted in teachers being unable to assist pupils who would give a wrong answer (Banda et al., 2012).

Results in this research revealed significant differences with small effect sizes in favour of PLP in all results that were significant, even when learners were introduced to a phonics-based approach that emphasizes the teaching of letter sounds, syllables and words. The high zero scores raise some concern with either the reading instruction or assessment method using Early Grade Reading Assessment testing procedures. As observed by Serpell and Simatende (2015), the EGRA baseline study in Zambia findings, cited in various public announcements 2013-2014, have been widely interpreted as showing that most learners at the end of Grade 2 had not acquired any basic literacy. The results seem to indicate that Zambian children at the end of Grade 2 have almost no reading skills at all. As this is a very dramatic finding, it is important to see the extent to which the assessment tool itself could explain the poor level of performance. Zambia must go a step further to explore ways in which EGRA tests could be improved. The Global Education and Monitoring Report (2016) give an example of the EGRA plus project in Liberia which trained teachers in the use of classroom-based assessment tools and provided reading resources and scripted lesson plans to guide instruction which had a substantial impact on raising previously low levels of reading achievement among Grade 2 and 3 pupils. Rather than documenting what most children in the lower primary cannot do, assessments should focus on identifying emergent competencies and developmental processes on which teachers and other agents of socialization can capitalize to nurture each learner's progress within a resource-constrained educational environment (Serpell & Simatende, 2015).

The rules of testing were not giving the opportunity to attempt to answer further items after a certain number of subsequent failures. For example, reading comprehension required learners to read the given text in order to answer comprehension questions. Therefore, interpreting the results of EGRA test to mean that most Grade 2 Zambian children cannot even decode letters may be an exaggeration of their incompetence. Furthermore, the rule of ending the assessment after five subsequent failures compromises the results of the letter sound knowledge, non-word decoding and oral passage reading. The pressure exerted on the children to be fast, may have compromised the results. Overall, the results raise the concern that there was something wrong with the testing procedures. The test seemed to be working for very few learners. The way in which children were assessed within limited time leads to the possibility that they might not have been able to demonstrate their best. From a cultural perspective, the idea of a child being tested by a strange adult within 15 minutes is very challenging. In my opinion, it is important to keep in mind that a time limited test does not allow children to perform at their best level and truly show what they are able to do. Although a time limited test has its own advantages, one disadvantage is that it does not portray children's real reading skills in a natural reading situation and in most of the cases the results over-exaggerate reading difficulties. Serpell (2014) indicates that, according to the findings by the Reading Support for Zambian Children (RESUZ) study conducted in Lusaka, which assessed the same reading competencies, many children who scored

zero on EGRA reading aloud non-word decoding (sounding out) and letter-sound knowledge test at Grade 2 in 2012, scored more than 25% correct on the untimed RESUZ Dictation test at the end of Grade 1 in 2011. EGRA results also depend on how the assessor behaves. Even with a good training for the research team, it is still possible that someone may conduct a test in a bit different way or may have more difficulties in creating rapport with the children than others. If one assessor behaves differently, this may cause the group means to vary because of the testing procedure. Therefore, consideration should be made to make an analysis to see if the assessors have an effect on the results or develop testing tools that do not vary unnecessarily.

In general, results are in favour of PLP with small effect sizes. Results are in favour of PLP which has been in existence only for two years compared to PRP that existed in schools for fifteen years. Given more time with constant support PLP may improve the reading levels in early grades in primary schools. The results are understandable as the children in the PRP four districts were taught with a method that did not place sufficient emphasis on letter-sound knowledge in familiar language. In addition, in PRP children were instructed to read in familiar language only for one year, though they continued to learn to read during Zambian language lessons. The PLP introduced from 2013 in twelve districts, places much emphasise on the five key reading skills: phonics, phonemic awareness, vocabulary, fluency and comprehension but three quarters of the teaching from Grade 1 is based on letter-sound knowledge which promotes learners to acquire basic decoding skills. In addition children were instructed to read in familiar language for two years before reading and writing in English were introduced from Grade 3. Although there were a large number of zero scorers, it should be noted that, in both PRP and PLP districts, not all children ended up obtaining zero scores for all variables.

Overall, these findings are similar to findings from previous studies which indicate low levels of reading among Grade 2 children. According to Matafwali and Bus (2013), about 50% of the children in Grades 1 and 2 were unable to read simple words, scoring zero or only one word on the reading tests in Zambian language. This pattern of performance indicates that the majority of children do not actually "breakthrough" and do not acquire word reading skills in the Zambian Language, as is promised by the curriculum. Furthermore, reading in the Zambian Language does not continue to improve or even stabilize. Instead, there is a slight decline when children shift to practicing reading in English in Grade 2. However, the difference between findings by this cross-sectional study and similar studies is in the massive number of zero scorers because of the possible assessment procedures.

Knowing the ways in which reading instruction in transparent writing has been shown to work (e.g. Aro, 2006), it is easy to observe that, moving from small grapheme-phoneme units to larger is too fast in the described Zambian methods of reading instruction in order to create a firm basis of learning to decode. The emphasis on trying to store word images almost from the beginning does not work in learning to read the first language which has a consistently

behaving writing, although it has features which are common in teaching reading of English, especially as the second language after one has learned to decode, following the alphabetic principle of L1 reading (Ojanen, 2013). The failure to read the whole passage up to the end because of limited time, contributed to large numbers of zero scores in reading comprehension. In order to improve on this, PLP requires appropriate reading materials. This is because reading requires a lot of exposure to relevant and appropriate reading materials. To strengthen the decoding skills acquired by learners through exposure to letter-sounds, schools should make efforts to ensure that children read material which motivates them to apply their new skill as much as possible (Lyytinen, et al. 2015). For most children, school is the only environment that can provide such opportunities for reading. Chansa-Kabali and Westerholm (2014), in their study, observe that in the family, the lack of children's books and parents' level of education, employment status and reading attitudes can compromise reading attainment.

7.4   Way forward

The low reading levels that Zambia is experiencing require a lot of effort for improving reading instruction in the early Grades. The Primary Reading Program that started in 1999 was reviewed and revised so that different teaching approaches for learning to read can be implemented in primary schools. Since results of the third study that measured if learners had acquired adequate skills for reading by Grade 2 indicate a small effect in favour of the Primary Literacy Program, now the Ministry of General Education must continue to strengthen and support the PLP that integrates the five skills for learning to read with emphasis on identifying letter-sounds, forming syllables words and reading for meaning. If learners identify letter-sounds instead of letter-names, they will be able to decode words and read in familiar languages. Letters help children living in transparent environments to store the phonemes quickly in long term memory – and reading accuracy soon hits ceiling (Lyytinen, H. et al., 2015). ., 2004).

Since the EGRA test may have problems related to the testing procedures, it is necessary to develop and use other assessment instruments to compare the findings of reading skills by end of Grade 2 to see what may happen to the large number of zero scores. The indication of this study is that, if Zambia reduced on peak zero scores, reading levels could improve. Therefore, there is need to improve reading instruction and also improve on testing procedures. The results of this study indicate that there were problems with test items that need revision in the future. In this study, there is a problem with data because of zero peaks. The testing procedure of EGRA has to be inspected to see the problems that it causes. It is almost unbelievable to have such a high peak of zero scores for almost all variables, except in orientation to print and listening comprehen-

sion. Assessments should aim to reveal not only weaknesses and needs, but also strengths and opportunities for improvement (Serpell & Simatende, 2016).

Assessors are human; even though they were trained in how to conduct tests they may make mistakes in administering the tests. Therefore, in order to standardize, for example, the listening comprehension, it is important to explore the use of recordings to which learners can listen and answer questions. By end of second Grade, learners should know how to read. The reading speed should be according to what is recommended in Zambia, 25 words per minute, not 100 words per minute, as demanded by EGRA. It has been noted in the Global Education Monitoring Report (2016), as observed by Gove and Cvelich, (2011) that EGRA tests are sensitive to the lower end of the achievement range, capable of detecting emerging skills.

The early transition from local language instruction to English may affect the development of reading skills among learners compared to where instruction in local language is conducted first in local language and gradually, side by side with English. This early exit should be substantially delayed. The Ministry of Education, Science, Vocational Training and Early Education (2013) in the revised Zambia Curriculum Framework recommends delaying the start of oral English until Grade 2, the use of local familiar languages from Grade 1 to 4 and the use of English as a subject/literacy for learning spoken English from Grade 3 to 4. In order to sustain learners' reading skills in familiar language, there is need to have courses that are interlinked from Grades 1 to 4 that should continue to develop learners' reading skills and build on learners' reading of letter-sounds, syllables, words, sentences and texts with understanding.

In order to sustain reading skills acquired from Grades 1 to 2, there is need to continue to provide both boys and girls with practice in reading by providing reading materials such as decodable stories and other story books that can help them to develop sight-words and strengthen the decoding skills they have learnt from the first grade. The materials provided should be appropriate to both boys and girls so that they can receive quality education without gender bias. This means that materials need to be gender sensitive and appropriate for both girls and boys. The more the learners practice to read, the more they can acquire adequate skills for reading in both familiar language and English.

Use of Information Communication Technology (ICT) to support reading instruction in schools and used by teachers as an additional tool for teaching reading or used by parents or community members at home to support reading at home, is becoming popular in Zambia. This is in a bid to make efforts to improve reading levels among learners in early grades. For example, Graphogame can be used to support reading instruction because it helps children to read in the shortest possible time. If learners in Zambia consistently used Graphogame for at least a longer period of time and to use it consistently, including in part of Grade 2, their reading levels could improve. This is because learners in Grade 1 – 4 do not have sufficient time to learn and spend about three and half hours in school and may not have enough practice, especially in environments that are usually not favorable, which is the case for Zambia.

In both Study 1 and Study 2, although assessors were trained and it was not the first time for most of them to work in this role, learners' performance may have been affected by the fact that assessors were not familiar to them and the warming up period was very short. In future, assessors should spend more time in schools so that, on the first day, assessors can prepare the learners and practice with them and conduct the tests the following day. This would bring the assessors closer to the learners and at the same time, familiarize learners with the testing procedures.

7.5   Recommendations

Strengthening communicative and functional approaches based on identifying letter-sounds of familiar languages, blending into syllables, forming words and reading a text with meaning, will help children being instructed to read in transparent languages to read very quickly. Letter name learning and blending into syllables supports and develops reading skills and therefore should be the focus of learning since the process will lead to reading texts with understanding.

Learners depend on classroom instruction by the teacher to learn to read. Ojanen et al. (2015) describes the use of digital game-based methods for addressing reading problems children face in familiar language as a more effective approach than other methods such as face to face instructional methods. It promotes very quickly letter-sound knowledge and develops reading skills. The Ministry of General Education should consider use of simple forms of cost effective technology. For example, Graphogame has been piloted in Lusaka, an urban district and Katete, a rural district, and so it can be used for multi-level promotion of literacy in Zambia's different environments. Just installed on cell phones and used by learners, teachers and parents, it shows positive results (Ojanen, 2015). It is an example of Information Communication Technology (ICT) that can be replicated in all schools.

Teachers' literacy skills vary significantly because most of them teach a familiar language in which they are not familiar and may have difficulties in letter-sound correspondence, even though they teach early grades. Teachers need to be informed about the differences between the phonics of English and the phonics of Zambian languages so that they do not continue to teach English letter-names during literacy instruction in familiar language. They can be supported by use of digital game-based activities installed on their cell phones where they can continue to practice letter-sounds. Adults are also motivated to play the games that support reading instruction and in this way they can learn together with their children at home.

Promotion of the skill to decode words and store the words in order to promote fluency depends on constantly being exposed to readers that create interest and motivate children to read. Provision of a variety of stories that are locally produced in familiar languages by learners, teachers and community members, can be a good resource. In the light of disseminating these resources

to all schools, exploring use of technology such as cell phones to install the stories can be an alternative that is cost effective to bring materials to learners' door steps. This is working well in pilots conducted by CAPOLSA and RTS "Makhalidwe Athu" projects in conjunction with communication providers through Public Private Partnerships.

Early Grade Reading Assessment tests were strictly timed and this was an unfamiliar experience to the learners in Zambia, especially in rural schools. There is a need to strengthen the capacity of the National Research Committee (NRC) that should work with the Examinations' Council to develop assessment tools that can respond to remedial needs through classroom-based assessment and help to diagnose learners with learning difficulties and be used by teachers to guide instruction.

While use of familiar language promotes acquisition of literacy skills and enhances effective learning in all subjects, it is also important to explore provision of learning in children's home language as much as possible. To be taught in a language that is not one's own or not spoken at home hinders early acquisition of critical skills in reading and affects self-esteem. Promotion of use of home language can contribute to greater support at home by the parents in the process of developing literacy. Therefore, schools require a variety of appropriate and interesting stories to read at school and at home with the parents.

The Primary Literacy Program showed significantly higher mean rank scores in several assessments than Primary Reading Program. The reason could be that the program is based on phonics-based approach that places great emphasis on teaching of letter-sounds and it has provided for more time to reading instruction in familiar languages. The program requires a lot of interesting, appropriate and relevant resources in familiar languages for reading so that skills acquired for decoding words and being able to read can be sustained. This also requires provision of reading materials and technology that is relevant to both boys and girls so that they are motivated to learn together.

Provision of intensive training for teachers in effective instructional methods for teaching reading is required. This should be implemented through both in-service and pre-service training. The colleges of education curriculum should allocate more time for teachers to learn and practice the methods of teaching that are implemented in school. Sometimes, good practices of teaching are introduced directly to the schools, without being implemented in colleges of education where teachers are "produced". In order to have long term sustainability, colleges of education must be involved in such programs.

7.6   Conclusions

Comparing the two programs, the results from this research may be interpreted as being in favour of PLP which has placed much emphasis on teaching the basic key components of learning to read (phonemic awareness, phonics, fluency, vocabulary and reading comprehension), and has also placed much empha-

sis on the phonics approach for teaching reading. However the lesson to learn from this research is that the significant differences between PRP and PLP demonstrate small effect sizes, and both programs had high proportions of zero scorers. This means that more needs to be done in order to ensure that PLP becomes more effective for better results than results established by this research. The question all researchers and educationists should consider for future research is: How can schools and teachers be helped to improve the levels of reading among children? There are innovations that can supplement the efforts that schools are making. Serpell (2014) observes that, with low levels of literacy, recent advances in technology have the potential to contribute to the success of the education sector to overcome that constraint. For example, it is already known from the RESUZ Grade 1 study (Folotiya et al., 2014), that exposure to forms of ICT (e.g. Graphogame) by both learners and teachers can significantly support initial literacy learning in familiar language, and they are strong grounds for believing that children who master basic literacy in a familiar language are better placed than others for acquiring literacy in a second language, such as English. In addition learners also need a variety of appropriate stories to read in familiar language. Teachers must also be equipped with skills to teach and support learners in multilingual situations. It is more especially effective when teachers know how to use phonics in literacy teaching and other forms of remediation can only give additional support to those who have learning difficulties. Graphogame is a typical example because it provides the opportunity for both teachers and children to learn phonics by playing the game. In countries where Graphogame has worked very well, such as Finland, teachers are using the same approach in classrooms as well as Graphogame for additional support. Since the curriculum has been revised in Zambia from 2014 to train teachers in phonics, the Ministry of General Education should plan to roll out Graphogame to more schools in order to improve reading levels. Additionally, Zambia needs to explore and determine the effectiveness of different forms of ICT across the full range of the nation's educational activities (Serpell, 2014).

The first two studies looked at the effects of each program and, in Study III; a comparison has been made to determine levels of reading in order to see which program has been more effective in improving the reading skills of learners in early grades in familiar languages by end of Grade 2. The observation is that, if testing procedures are not reliable, we cannot accurately determine reading levels in Zambia. The high peak of zero scorers shows problems with EGRA testing procedures. If it has to be used in the future, it must be investigated and improved upon. This study indicates that there is a need to have testing procedures that are reliable and comparable to other languages and other countries.

In the new Zambia Education Curriculum Framework by Ministry of Education, Science, Vocational Training and Early Education (2013), learning to read and write from Grade 1 to 2 in familiar language and oral English (listening and speaking) is introduced in Grade 2. Learning to read in English language is introduced from Grade 3, and skills for reading in familiar language

are consolidated during Zambian language lessons. It is hoped that the revised language of instruction strategy will give more time to learners to stabilize their reading skills in familiar language skills before English literacy begins. However, it remains to be seen if adding one year without English literacy instruction will help to establish literacy skills in familiar language. In order for the new curriculum to work, children need to reach reading fluency in familiar language before Grade 3 when English literacy begins. Reading fluency in the mother tongue lays a cognitive and linguistic foundation, not only for full literacy, but also for learning additional languages and other scholastic subjects (Ball, 2011). It has also been observed by Heugh (2000) that, when an additive education model is used where mother tongue(MT) is never removed as a medium of instruction; it leads to a high level of proficiency in both mother tongue and second language. It is argued that, if the mother tongue is removed as a medium of instruction, there can be no transfer of skills from mother tongue to the second or foreign language. Therefore, all actions to increase literacy instruction in Zambian language until reading fluency and reading comprehension is reached, are very promising trends for improving quality of education in Zambia.

This research reminds researchers and educationalists to take a keen interest in the effects of literacy programs implemented in Zambia, by working closely with the Ministry of General Education, to follow up implementation and suggest opportunities for development and improvements in Zambia's most constrained environments.

YHTEENVETO (FINNISH SUMMARY)

Kaksi kansallista lukutaidon opetusohjelmaa paikalliskielten lukemaan oppimisen mahdollistajina Sambian 1.–2.-luokkalaisilla

Lukutaidolla on ratkaiseva merkitys paitsi kouluoppimisessa myös laajemmin yhteiskunnallisessa kehityksessä, erityisesti Saharan eteläpuolisessa Afrikassa. Tämä tutkimus valottaa lasten lukemaan oppimisen tilannetta Sambiassa, vertaamalla kahden 2000-luvulla käytetyn lukutaidon opetusohjelman vaikutuksia lukutaidon kehittymiseen neljällä paikallisella kielellä toisen kouluvuoden loppuun mennessä.

Vuoteen 2000 asti lukutaidon perusteet opetettiin Sambiassa englannin kielellä. Laajat vertailututkimukset Saharan eteläpuolisissa maissa osoittivat 1990-luvun aikana, että Sambiassa oppimistulokset olivat huomattavan heikkoja. Ajatus lukutaidon opettamisesta oppilaiden omalla kielellä, tai kotiseudulla yleisimmin puhutulla paikallisella kielellä, alkoi saada kannatusta. Sambiassa on yli 70 paikallista kieltä, joista seitsemän yleisimmin puhuttua valittiin käyttöön kouluopetuksessa. Paikallisten kielten käyttöönottoa on hidastanut huoli kustannuksista, joita aiheutuu oppimateriaalien tuotannosta usealle kielelle, sekä opettajien valmiuksista opettaa paikalliskielten lukemista. Siirtymän jälkeen vuosisadan alusta on kannettu huolta myös siitä, oppivatko lapset riittävästi englannin kieltä peruskoulun aikana, mikäli lukutaitoa opetetaan paikallisella kielellä.

Lukutaidon oppimisen näkökulmasta on merkittävää, että sambialaiset kielet ovat bantukieliä, joissa on johdonmukainen kirjoitusjärjestelmä (kuten suomen kielessä). Laajoissa vertailututkimuksissa on havaittu, että lukemisen perusteiden oppiminen on nopeaa suomen kielellä ja että englannin kieli on lukutaidon oppimisen kannalta erityisen hankala. Näin ollen myös bantukielten pitäisi olla oppilaille helpompia lukutaidon opettelun kieliä kuin englanti riippumatta siitä, onko englanti heidän äidinkielensä vai ei.

Tässä tutkimuksessa kartoitettiin sambialaisten oppilaiden lukutaidon tasoa toisen kouluvuoden lopulla. Oppilaita oli opetettu kahdella eri paikalliskielisen lukutaidon opetusohjelmalla. Paikallisista kielistä tutkimuksen kohteena oli neljä (cinyanja, icibemba, kiikaonde ja silozi), mutta lasten oma kotona puhuttu kieli saattoi olla myös muu kuin kouluopetuksessa käytetty virallinen kieli. Erityisesti havainnoitiin sitä, miten lukemaan opettamisen tulokset näiden kahden opetusohjelman seuraamuksena muuttuivat sen mukaan, vastasiko opettajan käyttämä kieli lapsen kotona puhumaa kieltä vai ei.

Tutkimuksessa vertailtiin kahta opetusohjelmaa. Vuosina 1999–2014 oli käytössä Primary Reading Program (PRP), jonka opetusmenetelmissä oli vaikutteita englannin kielisestä lukutaidon opetuksesta. Vuosina 2013–2014 Sambiassa pilotoitiin uusi opetusohjelma Primary Literacy Program (PLP), joka otettiin valtakunnalliseen käyttöön 1. luokan oppilaille vuonna 2014. Tämän tutkimuksen aineisto kerättiin opetusohjelmien pilotointivaiheessa, jolloin osa kou-

luista seurasi vielä aiempaa PRP-ohjelmaa, ja osa kouluista pääsi seuraamaan uutta PLP-ohjelmaa ensimmäisen luokan alusta lähtien.

Uudessa opetusohjelmassa (PLP) on tärkeää, että oppilaat oppivat lukutaidon perusteet ensimmäisen kouluvuoden aikana ja harjaantuvat paikallisen kielen lukijoina toisen lukuvuoden loppuun mennessä. Suullinen englannin opetus alkaa jo toisella luokalla, ja kolmannella luokalla aloitetaan kirjallisen englannin opiskelu. Näin ollen lapset, joilla ei ole hyvää lukutaitoa paikallisella kielellä toisen kouluvuoden loppuun mennessä, ovat vaarassa jäädä jälkeen muista oppilaista.

Aiemmassa opetusohjelmassa (PRP) suullinen englanti alkoi jo ensimmäisellä luokalla ja kirjoitettu englanti toisella luokalla, joten uudessa PLP-ohjelmassa oppilailla on vuoden verran enemmän kouluopetusta ensisijaisesti paikallisen kielen johdonmukaiseen kirjoitukseen. PLP opettaa näin lukutaitoa paikallisella kielellä keskitetymmin kuin aiempi PRP-ohjelma. Näin ollen oppimistulosten pitäisi olla PLP-ohjelmassa parempia kuin PRP-ohjelmassa. PLP-ohjelmaa pilotoivat opettajat saivat koulutusta sen käyttöön ennen kuin tässä tutkimuksessa mukana olleet oppilaat aloittivat ensimmäisen luokan.

Uusi PLP-ohjelma sisältää aiempaa enemmän opetusta kirjain-äännevasteista, ja ohjelma on muutenkin suunniteltu johdonmukaiseen kirjoitusjärjestelmään paremmin sopivaksi kuin aiempi PRP, jossa käytettiin enemmän kokosana-menetelmää lukutaidon perusteiden opettamisessa. PLP neuvoo opettamaan ensin vokaaliäänteet ja sitten konsonanttiäänteet yhdistettynä kaikkiin vokaaleihin ja tavuihin. Tavujen opettelusta siirrytään sanojen lukemiseen, ja opetussuunnitelman mukaisesti oppilaiden pitäisi lukea sanoja ensimmäisen vuoden lopulla.

Lasten lukutaidon laaja-alainen arviointi seuraamusten havainnoimiseksi tehtiin kymmenissä maissa käytetyllä, Yhdysvalloissa kehitetyllä Early Grade Reading Assessment (EGRA) -menetelmällä. Tässä tutkimuksessa käytettiin EGRA:n icibemban-, kiikaonden-, cinyanjan- ja silozinkielisiä versioita. EGRA sisältää useita osatestejä lukemisen perustaitojen mittaamiseksi. Kohteina ovat kirjainten kirjoitukseen orientoituminen, kirjainten äännevasteiden tuntemus, epäsanojen lukeminen, tekstin lukeminen, luetun ymmärtäminen ja kuullun ymmärtäminen.

Tutkimukset tehtiin satunnaisotoksiin perustuneita aineistoja käyttäen. Aiemman PRP-ohjelman tutkimukseen osallistui 393 lasta, jotka poimittiin neljältä alueelta 40 koulusta. Uudemman PLP-ohjelman tuloksia mitattiin 1593 lapselta 160 koulusta 12 alueelta. Nämä koulut olivat PLP-ohjelman pilotoinnin yhteydessä saaneet koulutuksen uuden opetusohjelman käyttöön, ja tässä tutkimuksessa mukana olleet oppilaat aloittivat koulunsa uuden opetusohjelman mukaisesti. Tyypillisesti kustakin koululuokasta valittiin 10 oppilasta satunnaisesti.

Tulokset osoittivat, että vaikka uudempi opetusohjelma sisältää aiempaa enemmän paikallisen kielen kirjoituksen lukemiseen sopivaa harjoittelua, oppilaiden osaamisen taso toisen kouluvuoden lopulla oli edelleen hälyttävän alhaisella tasolla. Kummankin opetusohjelman oppilasryhmissä oli huomattavan

suuri osuus nollatuloksen saaneita oppilaita, eli oppilaita, jotka eivät saaneet yhtään pistettä missään EGRA:n osatestissä. Osatestien tulokset osoittivat, että PLP-oppilaiden osaaminen oli jonkin verran PRP-oppilaita parempi. Osaaminen jäi vaatimattomiksi, joskin uusi ohjelma antoi useassa muuttujassa tilastollisesti merkitsevästi paremman tuloksen, mutta vaikutuksen kokoa mittana käyttäen ero jäi marginaaliseksi. Tulokset kuitenkin osoittavat, että kun opetusohjelma opastaa opettaja kiinnittämään huomiota puhutun ja kirjoitetun kielen oppimisen perusteisiin, lähtien kirjainten äännevasteiden opetuksesta, tulokset paranevat. Tulosten dramaattinen heikkous näkyi siinä, että parhaimmillaankin suurin osa lapsista sai kaikista lukemista koskevista muuttujista nollan. Se, että mittaus sinänsä onnistui ilmenee siitä, että puhutun ymmärtämisestä saatiin odotetusti kohtuullisen hyviä tuloksia.

Paikallisten kielten hyväksyntä kouluopetuksessa liittyy huoleen siitä, että paikalliskieliä on paljon, ja ettei niistä kaikille ole mahdollista tehdä omia oppimateriaaleja. Toisin sanoen, vaikka opetusta annettaisiin paikallisella kielellä, opetuskieli ei välttämättä ole lasten oma äidinkieli tai ensimmäinen kieli. Tutkimuksessa kuitenkin havaittiin, ettei oppimistuloksissa ollut eroa, vaikka lasten kotikieli olikin eri kuin kouluopetuksessa käytettävä paikallinen kieli. Tämä johtuu todennäköisesti siitä, että kirjoitusjärjestelmä on kaikissa sambialaisissa kielissä samankaltainen, yhtä johdonmukainen. Opetusta on mahdollista seurata, vaikkei täydellisesti ymmärtäisikään kaikkea opettajan puhetta, kunhan opeteltavat äänteet, kirjaimet ja tavut tunnistetaan oikein. Eroja ei myöskään havaittu tyttöjen ja poikien välillä. PLP-ohjelman oppilaiden tulokset olivat PRP:hen verrattuna johdonmukaisesti hiukan parempia kaikissa osaryhmissä.

Uuden PLP-ohjelman heikot tulokset olivat kuitenkin kokonaisuudessaan huolestuttavalla tasolla. Oppilaiden erittäin heikkoon suoriutumiseen vaikuttivat monet taustatekijät, kuten se, että Sambiassa lapsilla on hyvin vähän altistusta kirjoitettuun kieleen ennen kouluikää. Varsinkin maaseudulla aikuisten lukutaidottomuus on edelleen yleistä, joten kotona ei useinkaan ole kirjoja, eivätkä vanhemmat lue lapsille tai yhdessä lasten kanssa. Varhaiskasvatusta ei ole tarjolla, ja tällä hetkellä monet päiväkodit ovat englanninkielisiä yksityisiä toimijoita, jotka ovat mahdollisia vain pienelle osalle lapsista. Heikkolaatuinen ravinto ja varhaislapsuuden sairaudet (kuten malaria) voivat aiheuttaa kehityksen viivästymiä. On ilmeistä, että suurin osa koulun aloittavista lapsista tutustuu kirjoitettuun kieleen ja lukumateriaaleihin vasta koulussa. Sambialaisilla lapsilla ei siten ole sellaisia valmiuksia lukutaidon opetteluun kuin länsimaissa elävillä, vaikka opetussuunnitelma edellyttääkin oppilailta lukutaidon omaksumista lähes samassa tahdissa kuin monissa länsimaissa.

Edellä mainituista syistä on hyvin tärkeää, että sambialaislasten koulu pystyy tarjoamaan laadukasta ja tuloksellista lukutaidon opetusta. Koulu voi olla ainoa ympäristö, missä lapsilla on pääsy lukumateriaalien pariin, joten on erittäin tärkeää, että opettajilla on hyvät opetustaidot, jotta paikalliskielisen lukutaidon oppiminen ennen toisen lukuvuoden loppua olisi mahdollista. Eivätkä ongelmat lopu tähän. Nekin lapset, jotka pystyvät omaksumaan peruslukutaidon, eivät pääse sitä harjoittamaan. Lapsille tarkoitettu lukumateriaali puut-

tuu käytännössä tyystin. Toiminnallinen lukutaito on saavutettavissa vain lukemista riittävästi harrastamalla, joten lastenkirjallisuuden kehittäminen ja kustannustehokas jakelu on mahdollistettava oppimistulosten parantamiseksi.

Hyvät neuvot ovat tarpeen lukutaidon saamiseksi Sambiassa tasolle, jota maassa kaivataan. Niitä Jyväskylän yliopistosta ohjattu lukemisen tutkimus on pyrkinyt tarjoamaan kouluttamalla lukemisen asiantuntijoita ymmärtämään täysin johdonmukaisesti käyttäytyvän kirjoituksen lukemaan opettamisen ja oppimisen perusteita. Konkreettina apuna siinä on Suomessa Ekapelinä tunnettu ja ulkomailla GraphoGame-nimisenä tutkittu oppimisympäristö. Sambia on esimerkki maasta, jossa digitaalisella tuella tarjotun opetteluavun tarve voi olla poikkeuksellisen merkittävä. Sen vaikutusta Sambiassa ovat tutkimuksen tekijä ja hänen sambialaiset kollegansa, esimerkiksi aiemmissa väitöskirjatutkimuksissaan, jo todistaneet. Kun halvimmat älypuhelimet, joissa GraphoGame toimii, alkavat vastata hinnaltaan sambialaisten perheiden käytettävissä olevia puhelimia, on mahdollista, että lapset saavat digitaalisista oppimisympäristöistä apua jo piankin. Ne tuovat lapsille myös kiinnostavaa luettavaa, kun verkkoyhteydet alkavat tavoittaa enemmistön väestöstä. Näin toiminnallisen lukutaidon saavuttamisen vaatimukset voivat täyttyä ja valmentaa Sambian lapsia seuraavaan koitokseen, englannin kielen oppimiseen puhuttuna ja kirjoitettuna.

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APPENDIX 1 Sample of Early Grade Reading Assessment Tool – Grade 2 2014

Database ID: _____

**Cinyanja/Zambia National Grade 2 Reading Assessment: Student Response Form
Administrator Instructions and Protocol – 2014**

General instructions

Establish a playful and relaxed rapport with the child through a short conversation (see example topics below). The child should perceive the assessment almost as a game to be enjoyed rather than a test. Use this time to identify in what language the child is most comfortable communicating. Read aloud slowly and clearly ONLY the sections in boxes.

> **Mwauka bwanji. Dzina langa ndine…………..ndipo ndimakhala ku………..Ndingakonde kukuuza za moyo wanga.** Good morning. My name is _____ and I live in _____. I'd like to tell you a little bit about myself.
>
> [Number and ages of children; favourite sport, radio or television program, etc.]
>
> 1. **Kodi umakonda kucita ciani ngati siuli mu sukulu?** What do you like to do when you are not in school?
>
>   [Wait for response; if student is reluctant, ask question 2, but if they seem comfortable continue to verbal consent].
>
> 2. **Kodi ndi masewera otani amene umakonda kusewera?** What games do you like to play?

7.6.1 Verbal Consent: **Read the text in the box clearly to the child.**

> - **Ndifuna kukuuza cifukwa cake ndabwera kuno lero. Ndimagwira nchito mu unduna wa maphunziro mu Zambia ndipo tikufuna kumvetsetsa mmene ana amaphunzirira kuwerenga ndi kuchita masamu. Iwe wasankhidwa mwamwai.** Let me tell you why I am here today. I work with the Ministry of Education and we are trying to understand how children learn to read. You were picked by chance.
> - **Ife tifuna thandizo lako pa nkhaniyi. Koma iwe suyenera kutengamo mbali ngati sufuna.** We would like your help in this. But you do not have to take part if you do not want to.
> - **Ife tizachita masewero a kuwerenga ndi kucita masamu. Ine ndizakufunsa kuwerenga malembo, mau ndi ka nthano kakafupi mokweza mau. Ndizakufunsanso kuzindikira manambala, kuwerengera ndi kuyankha mafunso ocepa.** We are going to play a reading game. I am going to ask you to read letters, words and a short story out loud.
> - **Mwakugwiritsa nchito koloko ili, ndizaona nthawi imene utenga kuti utsirize nchito zoperekedwazi.** Using this stopwatch/device/gadget, I will see how long it takes you to read.
> - **Zimene tizachita pano si mayeso ndipo sizidzakhudza magiredi ako pasukulu lino.** This is NOT a test and it will not affect your grade at school.
> - **Ndizakufunsanso mafunso ena onena za banja lako monga kuti ndi cilankhulo citi cimene banja lanu limagwiritsa nchito ndipo zimene banja lanu liri nazo.** I will also ask you other

> questions about your family, like what language your family uses at home and some of the things your family has.
> - **Sindizalemba dzina lako ndipo palibe aliyense adzadziwa za mayankho ako.** I will NOT write down your name so no one will know these are your answers.
> - **Kaciwirinso, sungatengemo mbali ngati sufuna kutero. Tikayamba kufunsa mafunso, ngati siufuna kuyankha funso ungakhale cete, zilibwino cabe.** Once again, you do not have to participate if you do not wish to. Once we begin, if you would rather not answer a question, that's all right.
> - **Kodi uli ndi mafunso alionse?** Do you have any questions?
> - **Kodi wakonzeka kuti tiyambe?** Are you ready to get started?

Check box if verbal consent is obtained: ☐ *YES*

(If verbal consent is not obtained, thank the child and move on to the next child, using this same form)

A. Date of assessment: (Example: 5 May 2013 = 5/03/2013)	Date: _____ Month: _____ Year: _____	J. Class:	☐ Grade X ☐ Grade X
B. Geographic area 1 name		K. Section:	
C. Geographic area 2 name:		L. Pupil number:	
D. Geographic area code:		M. Pupil birth date:	Mo_____ Yr_____
E. Administrator name:		N. Gender	☐ Boy ☐ Girl
F. Administrator code:			
G: School name:			
H: School EMIS code:		**Start Time**	_____ : _____ ☐ AM [Tick one] ☐ PM
I. School shift:	☐ = Full Day ☐ = Morning ☐ = Afternoon		

SUBTASK 1. ORIENTATION TO PRINT	📖 Page X	🕐 X
👈 Show the child a story passage in the pupil stimuli packet. Read the in-structions in the gray boxes below, recording the child's response before moving to the next instruction.		Materials: a passage from the pupil stimuli packet
Sindifuna kuti uwerenge tsopano. Pa pepela iri, ungayambire kuti kuwerenga? Ndionetse ndi cala cako.		
I don't want you to read this now. On this page, where would you begin to read? Show me with your finger.		
(Child puts finger on the top row, left-most word)	Correct	Incorrect	No Response
Tsapano ndionetse mbali imene udzawerenga motsatira.		
Now show me in which direction you would read next.		
(Child moves finger from left to right)	Correct	Incorrect	No Response
Ukafika kotsirizira kwa mzere, udzawerenga kuti motsatira?		
When you get to the end of the line, where would you read next?		
(Child moves finger to left-most word of second line)	Correct	Incorrect	No Response

SUB TASK 2. LETTER SOUND IDENTIFICATION	📖 Page 1	⏱ 60 seconds
✋ **Pano ndili ndi tsamba limene liri ndi malembo a alifabeti ya muchingerezi. Coonde ndiuze MVEKERO za malembo a alifabeti amene udziwa. Usanene maina ake. Koma mvekero zake.** Here is a page full of letters of the Chinyanja alphabet. Please tell me the SOUNDS of as many letters of the alphabet as you can. Not their names, but their sounds. [point to the letter A] **Mwacitsanzo, mvekero la lembo ili ndi /a/.** For example, the sound of this letter is /a/. [point to the letter p] **Tiye tiyeserere: ndiuze mvekero la lembo ili:** Let's practice: Tell me the sound of this letter. ✓✋ **Cabwino, mvekero la lembo ili ndi /p/** Good, the sound of this letter is /p/. ✗✋ **Mvekero la lembo ili ndi /p/** The sound of this letter is /p/. [point to the letter L] **Tsopano tiye tiyese lembo lina. Ndiuze mvekero la lembo ili.** Now let us try another one. Tell me the sound of this letter. ✓✋ **Cabwino, mvekero la lembo ili ndi /l/.** Good, the sound of this letter is /l/. ✗✋ **Mvekero la lembo ili ndi /l/.** The sound of this letter is /l/. [point to first letter] **Ndikanena kuti "tiyambe", uyambire apa ndi kupitiriza mopingasa tsamba ili. Lata pa lembo lirilonse ndipo ndiuze mvekero la lembo limenelo mmau okweza. Uwerenge mwamsanga ndiponso modekha. Ngati wafika pa lembo limene sudziwa, pitiriza kupita ku lembo lotsatira. Ika cala cako pa lembo loyamba. Wakonzeka? Yamba.** When I say "Begin," start here and go across the page. Point to each letter and tell me the sound of that letter in a loud voice. Read as quickly and carefully as you can. If you come to a letter you do not know, go on to the next letter. Put your finger on the first letter. Ready? Begin. 🖊 (/) Mark any incorrect letters with a slash (Ø) Circle self-corrections if you already marked the letter incorrect ( ]) Mark the final letter read with a bracket		Start the timer when the child reads the first letter. 🎧 If a child hesitates or stops on a letter for <u>3 SECONDS</u>, point to the next letter and say "Go on" ✋ When the timer reaches 0, say "stop." ✋ If the child does not provide a single correct response on the first line (10 items), say "Thank you!", discontinue this subtask, check the box at

Examples: A p L

	1	2	3	4	5	6	7	8	9	10	
m	N	A	J	K	u	I	k	m	D	(10)	the bottom, and go on to the next subtask.
C	D	U	K	b	w	o	I	A	L	(20)	
G	N	A	D	a	g	e	E	I	S	(30)	
l	R	A	T	A	i	a	f	W	V	(40)	
D	A	A	M	t	Y	L	a	i	N	(50)	
t	U	N	k	z	O	N	I	e	I	(60)	
u	Z	i	M	P	l	i	N	i	U	(70)	
A	P	T	k	A	M	a	W	c	B	(80)	
a	W	a	A	N	a	m	R	h	E	(90)	
n	A	a	U	o	S	l	n	T	O	(100)	

🖎 Time remaining on stopwatch at completion (number of SECONDS)

🖎 Exercise discontinued because the child had no correct answers in the first line

Wacita bwino! Tiye tipitirize patsamba lotsatira Good effort! Let's go on to the next section.

SUB TASK 3. NON-WORD DECODING/READING 📖 Page 2	⏱ 60 seconds
☛ **Pano pali mau opangidwa mcinyanja. Ndifuna kuti uwerenge mau amene ungakwanitse kuwerenga, Uwerenge mau awa osati masipelingi.** Here are some made-up words in Chinyanja. I would like you to read as many as you can. Do not spell the words, but read them.	Start the timer when the child reads the first word.
[point to the word "oli"] **Mwacitsanzo, liu lopangidwa ili ndi: "oli"** For example, this made-up word is: "oli".	
[point to the word "koki"] **Tiye tiyeserere: conde werenga liu ili.** Let's practice: Please read this word.	⤴ If a child hesitates or stops on a letter for 3 SEC-ONDS, point to the next word and say "Go on"
✓☛ **wacita bwino. Liu ili ili ndi "koki"** Good, This made-up word is "koki."	
✗☛ **Liu lopangidwa ili ndi "koki"** This made-up word is "koki."	
[point to the word "cota"] **Tsopano tiye tiyese liu lina: conde werenga liu ili:** Now let us try another one. Please read this word.	✋ When the timer reaches 0, say "stop."
✓☛ **"wacita bwino, liu lopangidwa ili ndi "cota"** Good, This made-up word is "cota."	
✗☛ **Liu lopangidwa ili ndi "cota"** This made-up word is "cota."	
[point to first word] **Ndikanena kuti "yamba" uyambire pano ndipo uwerenge mopingasa patsamba ili. Lata liu lirilonse ndipo uliwerenge mokweza. Uwerenge mofulumira ndi mosamala mmene ungakwanitsire. Ngati wapeza liu limene sudziwa, pita ku liu lotsatira. Ika cala cako pa liu loyamba. Wakonzeka? Yamba.** When I say "Begin," start here [point to first word] and read across the page [point]. Point to each word and read it in a loud voice. Read as quickly and carefully as you can. If you come to a word you do not know, go on to the next word. Put your finger on the first word. Ready? Begin.	✋ If the child does not provide a single correct response on the first line (5 items), say "Thank you!", discontinue this subtask, check the box at the bottom, and go on to the next subtask.
✎ (/) Mark any incorrect words with a slash (Ø) Circle self-corrections if you already marked the word incorrect ( ]) Mark the final word read with a bracket *Examples:* oli koki cota	

	1	2	3	4	5	
	Kelo	Nipe	gelu	atapi	mdzimu	(10)
	Rizi	ninane	umbe	wondi	ninda	(20)
	Ngalo	ledesi	tomo	fikiraku	zirama	(30)
	Mukudi	Yu	mwane	ane	dzimo	(40)
	Wekusera	liraku	anuli	ia	dzimoli	(50)
	Anauna	cofukwa	kubu	udi	mtisinaka	(60)
	Amoi	wera	diko	eka	kasuci	(70)
	Komi	ateta	nacho	lia	labo	(80)
	Nthua	menepa	ndaako	ncheto	balo	(90)
	Mtingi	mtanyama	ndokonda	mtutu	ko	(100)

Time remaining on stopwatch at completion (number of SECONDS)

Exercise discontinued because the child had no correct answers in the first line

Wacita bwino! Tiye tipitirize patsamba lotsatira Good effort! Let's go on to the next section.

SUBTASK4. ORAL PASSAGE READING(2014)	⏱ 60 seconds		SUBTASK5. READING COMPREHENSION - QUESTIONS
Show the child the sheet in the student stimulus booklet as you read the instructions.		☊ If a child hesitates or stops on a letter for 3 SECONDS, say "Go on"	After the child is finished reading, REMOVE the passage from in front of the child.
☚ **Pano pali ka nthano kakafupi. Ndifuna kuti uwerenge mokweza, mofulumira komanso mosamala. Ukatsiriza kuwerenge, ndizakufunsa mafunso onena za nkhani imene wawerenge. Ndikanena kuti " yamba," uwerenge bwino kwambiri mmene ungakwanisire. Ngati wapeza liu limene sudziwa, pita ku liu lotsatira. Ika cala cako pa liu loyamba. Wakonzeka? Yamba.** Here is a short story. I want you to read it aloud, quickly but carefully. When you finish, I will ask you some questions about what you have read. When I say "Begin," read the story as best as you can. If you come to a word you do not know, go on to the next word. Put your finger on the first word. Ready? Begin.		✋ If the child does not provide a single correct word on the first line of text. Do not ask any comprehension questions. If a child says "I don't know," mark as incorrect.	Ask the child only the questions related to the text read. A child must read all the text that corresponds with a given question. If the child does not provide a response to a question after 10 seconds, mark "no response" and continue to the next question. Do not repeat the question.
			☚ **Tsopano ndidzakufunsa mafunso ocepa onena za nthano imene wawerenga. Yesa kuyankha mafunso mmene ungakwanisire. Ungayankhe mafunso mcilankhulo ciricose cimene ukonda.** Now I am going to ask you a few questions about the story you just read. Try to answer the questions as well as you can. You can provide your answers in whichever language you prefer.
✍ (/) Mark any incorrect letters with a slash (Ø) Circle self-corrections if you already marked the letter incorrect ( ]) Mark the final letter read with a bracket			✍ (✓) 1 = Correct (✓) 0 = Incorrect (✓) . = No response.
			Questions [Answers]
Amai anapita kumsika m'masana tsiku <u>lina.</u>	6		**Ndani anapita kumsika?** (Amai)	1	0	.
Anasiya mwana ndi mkulu wake <u>Dolika.</u>	12		**Mwana anatsala ndi ndani?** (Dolika)	1	0	.

			1	0	.
Anzake a Dolika anabwera kudzamtenga pamodzi ndi mwanayo. Dolika ndi anzake anaphunzitsa mwana kuyimba. Anamuphunzitsa nyimbo ya alifabeti.	30	**Kodi mwana anaphunzitsiwa kucita ciani?** (Kuyimba)	1	0	.
Atabwerako kumsika amai, anapeza mwana ali kuyimba.	37	**Kodi mwana anadziwa bwanji kuyimba nyimbo ya alifabeti?** Dolika ndi anzake anamphunzitsa.	1	0	.
Amai anakondwera kwambiri.	40	**N'cifukwa ciani amai anakondwera?** (Mwana anali kuyimba)	1	0	.

✎ Time remaining on stopwatch at completion (number of SECONDS)

✎ Exercise discontinued: the child had no correct answers in the first line

Wacita bwino! Tiye tipitirize patsamba lotsatira Good effort! Let's go on to the next section.

SUBTASK6. Listening comprehension (2014)	⏱ 60 seconds	SUBTASK6 : Listening comprehension - Questions
Show the child the sheet in the student stimulus booklet as you read the instructions.	🎧 If a child hesitates or stops on a letter for 3 SECONDS, say "Go on" ✋ If the child does not provide a single correct word on the first line of text. Do not ask any comprehension questions. If a child says "I don't know," mark as incor-	After the child is finished reading, REMOVE the passage from in front of the child.
👂 **Pano pali nthano yayifupi. Ndifuna kuti uwerenge mokweza, mofulumira komanso mosamala. Ukatsiriza kuwerenge, ndizakufunsa mafunso onena za nkhani imene wawerenga. Ndikanena kuti " yamba," uwerenge bwino kwambiri mmene ungakwanisire. Ngati wapeza liu limene sudziwa, pita ku liu lotsatira. Ika cala cako pa liu loyamba. Wakonzeka? Yamba.** Here is a short story. I want you to read it aloud, quickly but carefully. When you finish, I will ask you some questions about what you have read. When I say "Begin," read the story as best as you can. If you come to a word you do not know, go on to the next word. Put your finger on the first word. Ready? Begin.		Ask the child only the questions related to the text read. A child must read all the text that corresponds with a given question. If the child does not provide a response to a question after 10 seconds, mark "no response" and continue to the next question. Do not repeat the question. 👂 **Tsopano ndidzakufunsa mafunso ocepa onena za nthano imene wawerenga. Yesa kuyankha mafunso mmene ungakwanisire. Ungayankhe mafunso mcilankhulo ciriconse cimene ukonda.** Now I am going to ask you a few questions about the story you just read. Try to answer the questions as well as you can. You can provide your answers in whichever language you prefer.
✎ (/) Mark any incorrect letters with a slash		✎ (✓) 1 = Correct

| (∅) Circle self-corrections if you already marked the letter incorrect
( ]) Mark the final letter read with a bracket | rect. | (✓) 0 = Incorrect
(✓) . = No response. | | |

		Questions [Answers]	1	0	.
Chikondi anali mwana <u>wamng'ono</u>.	4	**Kodi Chikondi anali mwana wotani?** [wamng'ono]	1	0	.
Tsiku lina, atacoka kusukulu amai ake anamutuma kumsika kukagula ndiwo. Alikuyenda anakumana ndi mnzake <u>Beti</u>.	20	**Kodi mnzake wa Chikondi anali ndani?** [Beti]	1	0	.
Awiriwo anayamba kusewera pamodzi. Posewerapo anataya ndalama ina. Motero, anagula repu cabe osagula <u>kabichi</u>.	33	**Ndi ndiwo zanji zimene Chikondi anapita kukagula?** [repu]	1	0	.
Anasowa cocita. Pamene amaganizira cocita anaona abambo ena akubwera. Iwowa ananyamula nkhuni ndi basiketi. Mtsikanayo anawathandiza kunyamula basiketi ndipo anamupatsa ndalama.	54	**Kodi anapeza bwanji ndalama ina yogulira ndiwo zina?** [anampatsa]	1	0	.
Iye anatenga ndalama ija nagulira kabichi. Nabwerera <u>kunyumba</u>.	62	**N'cifukwa ciani Chikondi anampatsa ndalamu abambo?** [kumuwonga]	1	0	.

✍ Time remaining on stopwatch at completion (number of SECONDS)

✍ Exercise discontinued: the child had no correct answers in the first line

Wacita bwino! Tiye tipitirize patsamba lotsatira Good effort! Let's go on to the next section.

APPENDIX 2   Sample of learner's stimulus for letter sound knowledge - Cinyanja

Example: A p L

M	N	A	J	K	u	I	k	M	d
C	d	U	K	b	w	O	I	A	L
G	n	A	D	a	g	E	E	I	s
L	r	A	T	A	i	A	f	W	v
D	a	A	M	t	Y	L	a	I	N
T	u	N	k	z	O	N	I	E	i
U	Z	I	M	P	l	I	N	I	U
A	p	T	k	A	M	A	W	C	B
A	w	A	N	a	M	R	H	E	
N	A	A	U	o	S	L	n	T	O

APPENDIX 3   Sample of learner's stimulus for non word decoding – Cinyanja

Example:	**ola**	**koki**	**Cota**	
Kelo	nipe	gelu	atapi	mdzimu
Rizi	ninane	umbe	wondi	ninda
Ngalo	ledesi	tomo	fikiraku	zirama
Mukudi	yu	mwane	Ane	dzimo
Wekusera	liraku	anuli	Ia	dzimoli
Anauna	cofukwa	kubu	Udi	mtisinaka
Amoi	wera	diko	Eka	kasuci
Komi	ateta	nacho	Lia	Labo
Nthua	menepa	ndaako	ncheto	Balo
Mtingi	mtanyama	ndokonda	mtutu	Ko

APPENDIX 4   **Sample of learner's stimulus for oral passage reading - Cinyanja**

Amai anapita kumsika m'masana tsiku lina. Anasiya mwana ndi mkulu wake Dolika. Anzake a Dolika anabwera kudzamtenga pamodzi ndi mwanayo. Dolika ndi anzake anaphunzitsa mwana kuyimba. Anamuphunzitsa nyimbo ya alifabeti. Atabwerako kumsika amai, anapeza mwana ali kuyimba. Amai anakondwera kwambiri.

APPENDIX 5   **Sample passage for listening comprehension – Cinyanja**

Patsiku lolemba Mangani anapita kusukulu.
Ananyamula mabuku ndi nyama m'chola cake.
Pamene anali kuyenda, anapeza galu wamukulu panjira. Anafuna kuthawira pathengo koma anagwa pansi. Yunifomu yake inada ndipo galu anatenga nyama yake. Mangani anathawira kunyumba. Pamene anafika kunyumba, m'bale wake anamubwereka yunifomu yake. Anakondwera.