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Jacqueline Jere-Folotiya

Influence Of Grade one Zambian Teachers And GraphoGame On Initial Literacy Acquisition: Lusaka District

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Influence Of Grade one Zambian Teachers And GraphoGame On Initial Literacy Acquisition: Lusaka District

by

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ABSTRACT

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Various research conducted in Zambia have revealed that literacy levels of Zambian learners are below the expected grade level. The Zambian Government has made huge financial investments in introducing the Primary Reading Programme (PRP), which emphasized the use of a familiar, indigenous language to teach basic literacy skills from grades one to three. However, research conducted nationwide after the introduction of PRP indicated that the proportion of learners achieving even the minimal expected standard of literacy by Grades 5 and 6 remains extremely low. Teachers play an important role in mediating the learning opportunities. The current study sought to investigate beliefs and practices of first grade teachers and the degree to which they influence learners' mastery of initial literacy skills in Lusaka district. The study further sought to determine if and how a literacy tool, GraphoGame, could interact with teacher variables to improve learners' literacy skills. Data for the current research was collected as part of a larger research project called the Reading Support for Zambian Children (RESUZ). At the core of the study was GraphoGame intervention, GraphoGame. Intervention groups were formed for learners, teachers and a combination of both. The current study used both qualitative and quantitative methods of data collection. The sample consisted of first grade teachers from Zambian Government schools (N = 63) age range 25-54 and their learners (N = 288) age range 6-9 years. Data on teachers' self-reported teaching practices and attitudes about intrinsic and extrinsic motivation, learner versus teacher centred approaches, personal theories of teaching and views about the curriculum was collected using a semi-structured questionnaire. Data collection on learners' literacy development was conducted using locally developed paper and pencil tests of ciNyanja spelling recognition and orthographic awareness. Basic descriptive and simple moderation analyses were used to analyse the data. Results showed that the teachers endorse the use of local language and the phonemic approach in the literacy curriculum. Teachers believe in the learner centred approach over the teacher centred approach. As a personal theory of teaching, they do not believe that every child can learn. They also believe they are intrinsically motivated, although they felt their remuneration was inadequate. Results revealed no significant impact of teacher characteristics and beliefs on literacy acquisition of learners. However, moderation analysis revealed that GraphoGame interacts with the following teacher variables: number of learners taught by the teacher, experience teaching literacy to first grade learners and experience teaching literacy in the local language. The study recommends that Government consider the use of town ciNyanja in the curriculum for Lusaka district; intrinsic motivation of teachers should be enhanced; the use of learner centred approaches should be emphasised; teaching qualification requirements for early grade teachers should be upgraded and GraphoGame can be potentially used to enhance literacy teaching skills of teachers.

Key words: first grade learners, teachers, motivation, teaching approaches, literacy curriculum, personal theories of teaching, GraphoGame

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Lusaka, August 2014
Jaqueline Jere-Folotiya

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1 INTRODUCTION

1.1 The importance of teachers in teaching of literacy

The ability to read and write is a key factor in living a productive and successful life. It is a highly valued skill for personal, social and economic wellbeing. It is through reading that individuals access their democratic rights and learn about the world around them. Without the ability to read, individuals would not be able to read instructions on a medicine bottle, fill in important documents, find meaningful employment or access important information on posters or billboards. Reading is therefore important for effective communication, for both the recipients and producers of written information. The significance of literacy development, especially in the early grades cannot be ignored. For young children, reading is important because it helps develop their language skills. Through reading children are exposed to new words, including their spelling and meanings. It enhances their imagination and creativity when children read various kinds of stories and create stories of their own. Governments and various societies all over the world are concerned with ensuring that their populace is literate. Investments in infrastructure for learners, publishing of reading and learning material, improving teacher training in order to ensure that teachers are well trained and reviewing curriculum are some examples of activities that Governments undertake to ensure that everything necessary for the learning and teaching process is available.

Teachers constitute an integral part of the teaching and learning process. They are the bringers of knowledge, facilitators of learning and brokers of relationships between the learners and society. The various roles played by teachers are extremely important in moulding learners to become productive and responsible members of society. Sanders and River (1996) suggest that the academic growth of learners is influenced more by teachers than any other single factor including families, neighbourhoods and the schools the learners attend. Teachers that work with young children have the very important task of imparting literacy skills. The quality of instruction given in the elementary

years of literacy teaching can determine whether or not children learn to read. Snow, Griffin and Burns (2005) emphasize the need to have a classroom teacher with the expertise to support children with a variety of abilities and needs in the process of teaching reading. They further state that the teachers' knowledge about effective reading instruction makes the single greatest difference in whether or not every child will have an effective opportunity to learn to read effectively. But what constitutes an effective teacher of literacy? Blair, Rupley and Nichols (2007) highlight research based qualities of excellent classroom teachers as presented by the International Reading Association. The subsequent paragraph will briefly discuss these qualities.

The first quality is that teachers of literacy must understand how children learn oral language and how they learn to read and write. They must also believe that children can learn these skills. There exists a link between the development of oral language and success in reading and writing. Allington and Cunningham (1996) underscore this point by stating that children who come to school with thousands of words in their head, which they can hear, understand and use in their daily lives are already on the path of learning success. The second quality refers to classroom management. Snow, Griffin and Burns (2005) refer to it as the teachers' ability to organize, direct and supervise the classroom environment so that effective learning occurs. Various skills and strategies are required of the teacher to effectively conduct the following classroom management tasks: allocation of classroom space to multiple users, supplying and arranging classroom materials, communicating expectations with regard to rules and expectations in order to create a positive classroom climate.

Continuous assessment of individual learners' reading progress is the third quality. Assessment is important because it helps the teachers tailor their reading instruction to the needs of the learners, thereby making their teaching relevant. Blair, Rupley and Nichols (2007) state that assessment should include a blend of both formal (through tests, class assignments, reading exercises and homework) and informal (interviews, observations, student's judgments of their own performance) instead of relying on one single form of assessment. Effective reading teachers form partnerships with other teachers, parents and the community. Parental involvement can make a powerful contribution towards the success of learners. It is therefore important for teachers to solicit the involvement of parents in school related activities, including reading.

The above paragraphs have attempted to highlight some of the important qualities of teachers. The qualities of an effective teacher of literacy have also been explained. Children learn to read from people – and the most important of these people are teachers. However, the approaches and materials teachers use in teaching literacy reflect an implicit set of beliefs, assumptions and knowledge about reading. According to Hoffman and Kugle (1981) instructional decisions made by teachers in the classroom are influenced by these beliefs and assumptions.

1.2 Contextual background and rationale of the study

1.2.1 Language of instruction in Zambia

The issue of language and education is one that has evolved over the decades. During the colonial period, mother tongue was used as a medium of instruction for the first two years of primary education and dominant vernacular until standard 5, after which English was introduced. After independence in 1965, a recommendation made earlier that English should be the medium of instruction was formerly endorsed by the national Government. It became enshrined in the Education act of 1966 (Linehan, 2004, p 2). Kashoki (1990) indicates that since 1966, when English was prescribed as the sole medium of instruction in the entire Zambian education system, the seven Zambian languages were being taught only as subjects. The reasoning behind this decision was that English would be a unifying factor in a nation that has so many other languages and dialects. Linehan (2004) explains that in 1977 the Government noted that learning in English was detrimental to educational achievement. However, this observation was superseded by concerns about national harmony. Teachers were however, allowed to use vernacular to explain some concepts that were difficult to understand in English. In 1991 a resolution was made that instruction would be conducted in vernacular from Grade one to four (Linehan, 2004). However, this was not implemented until 1995.

Various practical and pedagogical reasons were then given for a change in the language policy in favour of teaching initial literacy in the local languages. It was observed that literacy skills developed better when children learned these skills from a language they were most familiar with (local language) than when they are taught in English. Research that was conducted by Williams (1993) showed that in a sample of 227 there was inadequate comprehension in English among 85% of Grade 3 pupils, 84% of Grade 4 pupils and 74% of Grade 6 pupils. He also reported that reading levels in ciNyanja (as per Spelling convention for Zambian languages held by Centre for Promotion of literacy in Sub-Saharan Africa [CAPOLSA] standard, recommended by Banda et al (2008) in the harmonization monograph published by centre for Advanced Studies of African Society [CASAS]) were poor. The Southern and Eastern Consortium for Monitoring Educational Quality (SACMEQ) (1995) conducted a study to assess the reading levels in English at Grade 6. Results from this study revealed that 25% of the learners in Zambia read at minimum levels, and only 3% were able to read at desirable levels.

As a measure to improve the quality of education being offered at primary school-level in Zambia, a new language policy, which emphasizes the teaching of basic reading and writing skills in Grade one in a local language was introduced (Ministry of Education [MOE], 1996). English remained the medium of instruction for other subjects. The need to change the medium of instruction from English to a more familiar language was further supported by

research conducted elsewhere in Africa. For example, Afolayan (1999) reported that use of the local language (Yoruba) as the medium of instruction in the Western region of Nigeria, was more effective in aiding the acquisition of literacy skills than English. These skills would then be transferred to a language that the child was not so familiar with (English). Similar findings were found by Umolo (1999) from Nigeria when he used this approach with special needs learners who were non-readers after their primary school education. Williams and Mchazime (1999) also supported bilingual literacy acquisition instruction using the mother tongue, while still acknowledging the importance of English in the region. In a study conducted in Malawi to investigate the reading proficiency in English and ciCewa, one of the major observations was that reading, listening comprehension and speaking in the mother tongue were much easier for learners when the study was conducted in the mother tongue than when it was conducted in English.

Apart from increasing literacy levels, it was believed that teaching in the local languages would also help increase the status of the local languages in the communities. It was with this background that Zambia introduced the Primary Reading Programme, which emphasizes the LGraanguage Experience Approach (LEA). Seven languages were selected for use as the language of instruction in initial literacy. One of the major challenges highlighted is the selection of only seven local languages from more than 72 dialects. The possibly of creating a tribal education system was cited especially if teachers were deployed to teach in areas where their own language was spoken (Linehan, 2004). It was observed that it would be difficult to select an all inclusive language as learners hailed from different language backgrounds. In addition urban children who were not familiar with the local languages would be disadvantaged. However the biggest concern, according to Linehan (2004), was that the parents would not be in support of their children learning in vernacular. Efforts were made to sensitize both parents and teachers.

1.2.2 The Primary Reading Program

The Primary Reading Programme (PRP) is a seven year plan of action which emphasizes the use of initial literacy instruction in a familiar language in Grade 1 before the introduction of English in Grade 2. It was developed by the South African NGO called Molteno Institute for Language and Literacy (MIll) formerly known as the Molteno project. Sampa (2005) reports that in 1998 the programme was implemented as a pilot in Northern Province in Grade one. It was piloted in 2 districts, Kasama and Mungwi and involved 25 schools, 50 teachers and 2000 pupils. The pilot for Step in to English and Read On courses was conducted in 2001. It included 94 teachers, 104 classes in five districts: Chipata, Kasama, Luangwa, Lusaka and Mongu. The New Breakthrough to Literacy (NBTL) was implemented in all schools in 2003, while Step into English (SITE) and Read on Course (ROC) were implemented in 2004.

The first component of the PRP, New Breakthrough to Literacy (NBTL) course is offered in Grade one. NBTL uses the Language Experience Approach

(LEA). It brings to the classroom what the learners know through the use of a familiar local language (preferably their mother tongue) and the learners' every day experiences. It teaches learners to compose sentences based on their knowledge and experiences with the language. Learners are then taught to write the words through the use of printed cards. The learner centred approach is used with the view of identifying individual learning needs. It also uses other approaches such as the phonics approach which emphasizes the use of letter sounds to teach literacy. The phonics approach helps learners understand how letters are linked to sounds to form letter-sound correspondences and spelling patterns. This knowledge develops and enhances learners' decoding and spelling skills, thereby enabling them to read and write. In order for the learner to acquire effectively these skills and knowledge, the teachers' own level of phonemic awareness plays an important role. It is essential that Zambian teachers are well versed in the letter-sound correspondences of the local language they use to teach literacy. Their level of phonemic awareness will determine the quality of instruction they will give to the learners.

The NBTL also uses the syllabic approach which focuses on syllables from which words can be built and identified, the look and say approach which encourages the identification of words through the use of flash cards and lastly the real books approach. The real book approach focuses on teaching learners to read by letting them read real books alone and with others. It promotes and encourages the use of group work amongst the learners by dividing the learners into various ability groups during literacy hour. This within-class ability grouping is a feature of the NBTL. The teacher is responsible for dividing the learners within groups of not more than 10 learners based on the teachers' assessment of the learners reading progression. Due to the large number of learners in Zambian classrooms, these groups usually consist of between 15 and 20 learners. These ability groups are identified by a wide variety of names in the local language ranging from animals to colours. These ability groups (also known as pace groups) are conducted for about 20 minutes in a 3 stage procedure. In the first stage individual groups interact with the teacher at the teaching station. Learners either tell a story or are told a story by the teacher. They also receive instructions for the day's activity from the station. In the second stage, the teacher conducts focused teaching to a particular group, while the other groups conduct independent learning activities at their learning stations. The third stage is the concluding stage. Learners from the various groups are encouraged to share their group activities. They are also encouraged to provide constructive comments and criticisms on the feedback given by other groups.

The various methodologies used in NBTL have also been adopted by a learning programme called "Learning at Taonga market". This is an Interactive Radio Instruction (IRI) which was founded as an alternative means to deliver the basic education curriculum to learners who were not able to attend Government schools. Therefore out-of-school children or those in community schools were the target audience. Teaching using this method takes place

through a radio broadcast that guides teachers and learners through the activities of the lesson. Through this process, learners and teachers actively participate through singing, reading, writing and problem solving. Some aspects of NBTL and SITE have been integrated into Taonga market. These include the use of the phonics approach and the LEA. The local language is also used as the medium of instruction. The main aim of the programme is to deliver the Zambian school curriculum from Grades 1-7. The programme is structured to deliver lessons in line with the MOE's three term calendar. Each grade level has 150 lessons per year, 50 lessons per term. Each lesson lasts 30 minutes. Five teacher training broadcasts are presented at the beginning of each term (MOE, 2005). In 2005 a pilot project to use Taonga market educational broadcasts in Government schools was approved by the Zambian Government. In Government schools, Taonga market is conducted in understaffed schools, schools with untrained teachers or schools in which teachers are teaching more than one grade. While some Government schools continue to use Taonga market as a teaching resource, other schools have either never used it or have discontinued its use due to lack of radios.

Basic literacy skills in English are taught in Grade two using the Step into English course (SITE). It is a learner centred approach that recognizes the experiences and needs of the learner. It encourages co-operative learning and allows individual learners to develop at their own pace (MOE, 2002). Like NBTL, it follows the Language Experience Approach (LEA). It builds on local language literacy skills in Grade one. It then helps the learner use these skills to read and write in English, while still enhancing literacy skills in the local language. After completing Grade one, learners should have mastered the basic reading skills in their local language. The learners should also have some basic oral skills in English. The role of SITE is to introduce learners to reading in English by emphasizing essential skills for reading in English that are not taught in Zambian languages. SITE acts as a bridge between NBTL and the Read on Course (ROC) in grade three.

The Read on Course is offered from Grades three to seven. This component of PRP is designed to help learners further enhance literacy skills acquired in grades one and two to levels required for the higher grades. It helps learners learn to read and understand a variety of material such as novels, newspapers, text books and reference books (MOE, 2003). It also ensures that learners' writing skills are enhanced so as to enable them write for a variety of situations. It consolidates learners' reading and writing skills in English and the local languages. Both languages have been given equal teaching time during the literacy hour. English remains the medium of instruction. In grades three and four, literacy lessons are conducted for one hour per day. Grades five to seven the literacy lessons have two hour long sessions per week and one half hour period (MOE, 2003).

The PRP was first piloted in Northern Province in 1999. A year later, the programme spread on full time scale to the other eight provinces throughout the country (Zambia). Sampa (2005) reports that the programme, which started

as a pilot in 25 schools was successfully rolled out to 4271 schools and teachers nationwide. An evaluation of the programme was conducted in the same year and it was described as 'A great success' (p.23). Literacy levels had risen to 64 %. He further reports that learners began to read and write at their expected grade level in the Zambia languages and one level below their grade level in English. Results for the SITE and ROC pilots were described as "encouraging" (p. 24). However, despite Government's investment in the PRP, with the hope of improving reading levels of Zambian learners, very little progress has been made. Two major observations are made about the research conducted on literacy.

Research has focused mainly on learners' learning outcomes, without establishing a possible cause and effect relationship between these outcomes and other variables that may be contributing to low learning outcomes. For example, the Examinations Performance Review (2012) mentions factors such as lack of textbooks, lack of desks and blackboards, class size, to mention but a few, as possible contributors to the poor performance of learners. Secondly, generally research in Zambia has focused on assessing learners' knowledge in various literacy skills at the exclusion of the imparters of that knowledge – the teachers. This begs the question about the role of first grade teachers in the teaching of literacy skills "what teacher factors affect the acquisition of literacy skills?" Previous research in Zambia has not focused on this area despite the fact that teachers play a pivotal role in how children learn how to read and write (Joshi, Binks, Hougen, Dahlgren, Ocker-Dean, & Smith, 2009). The focus of research in the field of literacy pedagogy continues to be on generic curriculum and methods. However, other factors such as teachers' professional beliefs shape classroom practices, which in turn determine the extent to which learners acquire literacy skills (Cuban, 1993). The current study sought to understand teacher characteristics and professional beliefs that relate to teacher motivation, personal theories of teaching, teaching approaches and the NBTL curriculum and how these impact literacy acquisition. It also sought to determine if and how a literacy tool, GraphoGame, had an impact on teacher characteristics to influence literacy acquisition of learners.

1.3 Theoretical framework

The teacher questionnaire was informed by various theoretical perspectives. The questionnaire was used to clarify and/or confirm certain dimensions of teacher beliefs that unfolded from the analysis of the Focus Group discussions conducted earlier. The demographic section of the questionnaire provided information on the characteristics of individual teachers. These characteristics included the age of the teachers, teaching experience, mother tongue, PRP training and other teaching qualifications. The questionnaire was also designed to allow more precise information about aspects of the NBTL curriculum that are perceived by serving teachers as difficult or problematic areas. It also aimed

to determine the beliefs of teachers on different dimensions. The four dimensions were presented on a 5 point Likert scale as follows:

1. Concern/discontent about the NBTL
2. Beliefs about learning (teacher centred or pupil centred)
3. Motivation of the teachers (intrinsic or extrinsic/ internal/external locus of control
4. Philosophy of teaching (personal theories of teaching).

It was envisioned that responses to these dimensions would increase our understanding of Zambian first grade teachers' beliefs. The first dimension was designed to generate some insight into the teachers' beliefs about the NBTL. The hypothesis here was that a low score on this dimension will be indicative of a negative feeling or discontent/concern about the NBTL, which is the medium of instruction at Grade one level. It was believed that this negative attitude would negatively impact the performance of learners.

The second dimension attempted to provide insight into whether the teachers are more teacher-centred or pupil-centred in their teaching approach. This dimension sought to clarify which approach the first grade teachers believe they are more oriented towards. Although a much deeper understanding of why they prefer one approach over the other is beyond the scope of this thesis, knowing the beliefs of the teachers is a necessary first step. Schweisfurth (2011) acknowledges that while literature makes a strong case for pupil centred over the teacher centred approach it acknowledges that the implementation of the former is difficult for practical reasons. Schweisfurth (2011) further explains that the hypothesis governing the construction of this dimension is that teachers who prefer the learner-centred over the teacher-centred approach are more likely to have pupils who will acquire literacy skills better than those who prefer the teacher-centred approach.

The third dimension is one that has received much attention locally and internationally. Motivation or the lack thereof, is an important determinant of both quality and quantity of performance. In Zambia, as is the case in other African countries, much emphasis has focused on the extrinsic aspect of motivation. This is seen in the emphasis placed on external motivators such as housing, improved salaries and other perks, which do not focus on the intrinsic aspect of teacher motivation. While it cannot be denied that motivation is certainly improved by these external elements, there has been very little, if any research on the impact of intrinsic motivation on learning outcomes. It is well cited in the literature related to motivation that the performance of an individual with intrinsic motivation is better than an extrinsically motivated one. The former is likely to be more persistent. Research has shown that once extrinsic rewards are removed or perceived inadequate by the individual, motivation to perform the required tasks reduces (Kassin, Fein, Markus, 2013). This dimension was aimed at establishing whether the beliefs of teachers regarding their motivation were more intrinsically or extrinsically oriented.

The final dimension is the personal theories of teaching domain. This dimension attempted to provide insight into the beliefs that teachers have about teaching and learning in relation to the individual needs of the pupils in their classrooms. This is a very important dimension to establish in our Zambia context, where beliefs of teachers are yet to be explored by teachers themselves. Furthermore, beliefs in general are yet to be acknowledged and integrated as part of the curriculum in teacher training institutions. Various researchers have shown that there exists a connection between beliefs of teachers and their classroom practices (Sigel, 1990; Olson & Bruner, 1996; Renninger, 1998; Sarason, 2001). Through this dimension an attempt was made to assess individual differences in beliefs among Lusaka teachers. Identified beliefs on all four dimensions were analysed in relation to the performance of first grade learners taught by the teachers in this study.

The dimensions explained in the paragraphs above were then analysed with the data from the learners' scores on the tests that assessed the emergent literacy skills and spelling competence of the learners. In this study, literacy was observed from two main levels; individual and cultural levels. At the individual level the learners' performance on the two cognitive tests was considered. These tests were individually administered to the learners. High scores on these tests signified high levels of literacy and vice versa. At a cultural level, the various cultural practices of literacy were considered. These included the use of Zambian local languages as medium of literacy instruction. This is very important because Zambia has seven official languages that are used to teach literacy. In this study, ciNyanja was used to conduct assessments with learners. It is the local language that is used in Lusaka and Eastern Province, as the language of literacy instruction in Government schools. Learner's competency in ciNyanja was first assessed to ensure that all the learners who participated in the research were familiar with the language.

Zambian classrooms comprise learners from various linguistic backgrounds. It was important to assess their competency in ciNyanja because some learners may have transferred from other geographical locations where ciNyanja is not used as the language of instruction. Some learners may not be competent in ciNaynja because it is not their mother tongue and they do not speak it at home. It is important to mention that the ciNyanja referred to here is actually ciCewa, which is the original Bantu dialect spoken by the ciCewa people. The urban lingua franca, ciNyanja is principally derived from CiCewa but with a substantial mix of ciNsenga and English. The spelling systems of ciCewa and ciNyanja are very similar although some stark differences exist in the spelling systems of the two languages.

In Lusaka, learners are more familiar with "town Nyanja". This is the urban form of ciNyanja that is the lingua franca widely spoken in Lusaka. It incorporates features of other Zambian languages such as iciBemba, ciTonga and ciNsenga. It also includes many words derived from the English language. A lot of code switching actually takes place between town ciNyanja and ciCewa, especially in Lusaka. Currently Town Nyanja has no official status in

Zambia. However, researchers have taken an interest in the fact that learners are more familiar with town ciNyanja than they are with ciCewa. This discrepancy between the familiar language of learners (town ciNyanja) and the official language of instruction in the classroom (ciCewa) has been identified as a barrier to literacy acquisition of learners in Lusaka province (Tambulukani & Bus, 2012). Organizations such as the Centre for the Promotion of Literacy in Sub-Saharan Africa (CAPOLSA) and iSchool acknowledge the importance of town ciNyanja as a language that is familiar to most learners, which therefore has an important role to play in their literacy acquisition (Gray, Lubasi & Bwalya, 2013).

Responses to the open ended questions in the questionnaire provided additional information on teachers. They were included as an attempt to better understand and extract from the teachers their experiences and motivations for being teachers. Aspects of personal experiences and motivation behind why teachers do what they do will help us identify and further explain what their personal beliefs about teaching are. Having them identify what they like and dislike the most about being a teacher would provide valuable information on what experiences motivate or demotivate teachers in the teaching process. It was hoped that these questions would help us understand first grade teachers better.

To emphasize the importance of teacher beliefs in the learning process, this study applied two theoretical models. Literature from research in the field of teacher cognition and early literacy instruction emphasizes the importance of teachers and their beliefs in the teaching process. This underscores the need to examine the social, cognitive and psychological factors that contribute to belief formation and how these manifest in the teaching process. The theoretical writings of Lev Vygotsky (1978) and Pierre Bourdieu (1984) have influenced the sociocultural perspective adopted in the present study. Vygotsky's socio-cultural view of the nature of language and literacy for teaching and learning will be used to explain the role of the teacher in teaching and learning process. It highlights the importance and role of teacher beliefs and how these influence the teaching and learning process. Bourdieu's socio-historical perspective of habitus that relates new experiences to past experiences is used to explain the formation of beliefs and how they manifest in daily life.

1.3.1 Vygotsky's sociocultural theory

Vygotsky's model of teaching and learning has significantly influenced early literacy programs for example Reading Recovery and Guided Learning (Blake & Pope, 2008). The theory emphasizes the learner rather than the teacher centred approach. According to Vygotsky (1978), the former maintains meaningful and productive collaborative activities that need to be engaged in by both the teachers and the learners, while the latter centres only on a one way flow of information from the teacher to the learners. The theory explains how the teacher, in the scaffolding role, through the zone of proximal development (ZPD) provides opportunities for the learners to learn. Vygotsky makes

reference to the term "more competent other". He uses this term to refer to an individual (teacher, peer, parent, etc.) who is more skilled or knowledgeable than the child. The competent other assists the child through the ZPD.

Instruction and learning impact development through the zone of proximal development (ZPD) and not the zone of actual development (ZAD). The ZPD requires adults and peers to provide assistance to students who cannot complete the assigned task without help. In this study the more competent others are the teachers. In the teaching process, the teacher is providing assistance to the learners and the learners are able to acquire the relevant skills imparted by the teacher. When operating within the ZPD, students need active teaching. Teachers should explain, model and use guided practice in the classroom (Utah Education Network, 2005). Rogoff, (1990) characterized this process as guided participation. This kind of instruction involves the process of scaffolding. This is a form of "adult assistance that enables a child or novice to solve a problem, carry out a task or achieve a goal which would be beyond his unassisted efforts" (Daniels, 2001, p.107). It is through this process that learners acquire, master and develop complex reading skills. Instruction and learning occur in the ZDP and it is here that the teacher must focus (Blake & Pope, 2008). Understanding the ZPD expands the ways in which teachers can guide and influence the child's learning activity.

Both the teachers and the learners bring to the classroom experiences and knowledge derived through various cultural and psychological tools. The framework being proposed here is that the teacher, as a facilitator of the learning process, brings to the classroom personal cultural experiences and psychological tools. These manifest as beliefs and characteristics which impact the acquisition of knowledge as the teacher interacts with the learners.

Vygotsky's sociocultural theory of learning acknowledges the dynamic interplay between teachers, learners and tasks and views learning as arising from these interactions. The interactions refer to teaching approaches, whether they are learner-centred or teacher-centred. The theory was employed in this study to inform the research regarding the learning process of learners as mediated or facilitated by the teacher. It was also employed to account for the teachers' implicit beliefs about how literacy instruction should be conducted. It is therefore being proposed that the implicit beliefs of the teachers regarding the NBTL, motivation (whether intrinsic or extrinsic), personal theories of teaching and teaching approaches are embedded in their personal prior experiences. These beliefs impact practical literacy instruction in the classroom.

As teachers (facilitators) operate within the ZDP through guided participation and scaffolding, the NBTL curriculum was used as a tool to facilitate the learning process. The internalization of knowledge was observed by the acquisition of literacy skills and the ability to use to these skills to read independently. The emphasis on language as an important tool that enables sharing in social interactions, is further fortified by the use of the local language as a tool of communication in the process of knowledge construction and reconstruction between the learner and the teacher.

1.3.2. Bourdieu's theory of habitus

In his theory of cultural reproduction, Bourdieu (1977) makes reference to the concept of cultural capital. He states that cultural capital consists of familiarity with the dominant culture in society. He further explains that the possession of this cultural capital varies with social class. He sees power as culturally and symbolically created, and constantly re-legitimized through interplay of agency and structure. This happens through what he refers to as 'habitus' or socialized norms or tendencies that guide behaviour and thinking. Habitus is 'the way society becomes deposited in persons in the form of lasting dispositions, or trained capacities and structured propensities to think, feel and act in determinant ways, which then guide them' (Wacquant 2005, p 316, cited in Navarro 2006, p 16).

Bourdieu (1977) proposes that habitus is produced by history and the active presence of the past. Habitus helps in relating new experiences to past experiences. He further notes that it contains both collective and individual characteristics. The collective notion of habitus helps retain individuality because it is perceived more general at the society level and more complex at the level of the individual. Therein lies the understanding of how individual actions are guided by beliefs and opinions. Whereas cultural capital consists of the possession of legitimate knowledge, habitus is a set of beliefs, attitudes and values (Sullivan, 2002). Akkari, Serpell, Baker and Sonneschein (1998) contribute to this definition by stating that these dispositions are enduring by nature and are transferrable from one context to another. They are acquired through the socialization process and eventually internalized by the individual. In essence, they are beliefs and attitudes. It is these beliefs and attitudes that determine the manner in which an individual perceives, thinks and acts in various situations.

In the current research, beliefs were assessed by administering a questionnaire to individual teachers. Going by Bourdieu's explanation, different teachers possess different habitus, different dispositions and therefore different beliefs due to different past experiences, these differences manifest differently in teachers in the classroom setting. Although the assessment of this culturally contextualised analysis was not the focus of this study, the researcher acknowledges that cultural contexts influence the beliefs held by teachers. Bourdieu's theory was used to address issues of beliefs and practices as embodied in the individual.

Insights from Bourdieu and Vygotsky's theories have been used to formulate the theoretical model presented in the following section. The model has made reference to cultural historical contexts of both learners and teachers. In the context of this study, this referred to the policy changes and significant events that took place during the development of education in Zambia pre and post-independence. This includes the various shifts in the use of local language as the medium of instruction. Before independence mother tongue was used as the medium of instruction until grade 5. English was taught thereafter. After

independence in 1966, English was introduced as the medium of instruction. Pedagogically, this decision was made based on the belief that children learn a language faster when it is introduced to them in their early years of schooling. Politically, Zambia has seven national languages, with 72 dialects. It was believed that English would serve the purpose of uniting the Zambian people from diverse tribes and languages. However, due to the poor literacy levels that were observed, the decision was reversed. Learners should be taught initial literacy skills in a familiar language for the first three years of schooling. This decision was implemented through the PRP in 1997. At the beginning of 2014 this policy was modified. The Government decided that the local languages should be used as the medium of instruction for all subjects for the first four years of schooling.

The changes to the education policy outlined in the above paragraph had implications for teachers. At every point, teachers were trained in line with the changes that had taken place. Training institutions had to modify their teacher training curricula to accommodate the policy changes each time they took place. This meant that teacher beliefs about how and why children should be taught in a particular language were in constant flux. Furthermore, teachers themselves were taught to read and write under a policy that was different from the one they are now expected to use as teachers. For many teachers, the teacher training they received was conducted under a different policy from the prevailing one. Therefore the current teachers are part of a generation that underwent different teaching training experiences that were in line with the policy at the time of training. Apart from the various policy changes that have taken place, it is important to recognise that the status of the teaching profession has declined over the years. This is reflected in the poor working conditions and strikes to have these improved. The Government has tried to improve these conditions although not to the desired levels. Due to these poor working conditions, many teachers have left the teaching profession.

1.4 Theoretical model

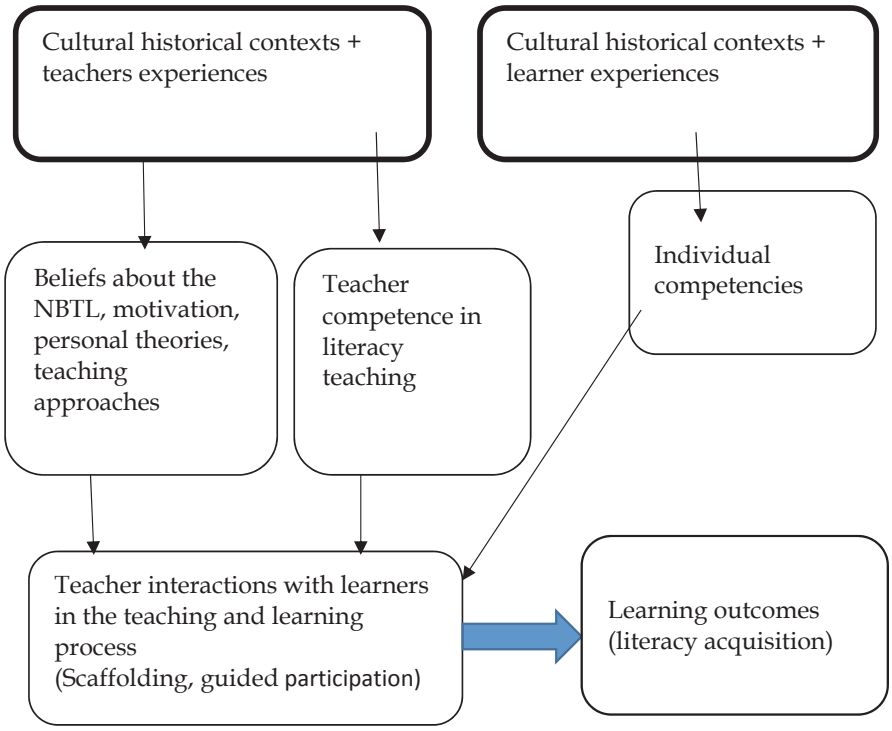

FIGURE 1 Theoretical model of the study

1.5 Significance of the study

Many research studies have acknowledged the importance of teachers in ensuring high quality education for learners, regardless of the country (Carr-Hill, 1984; Riddell, 1998; Motala, 2001; O'Sullivan, 2020; VSO, 2002; UNESCO, 2005). Inspite of this important fact, very little is known about Zambian teachers, especially first grade teachers of literacy. The current study was therefore designed to contribute to this limited body of knowledge. It was hoped that the information generated in this study would contribute to current literature on factors that contribute to literacy acquisition. As the Zambian Government is working towards integrating Information Communication and Technology in education, it was hoped that information on GraphoGame and how it interacts with teacher variables will be useful for teaching training. It will also be useful for projects in Zambia and all around the world that conduct research with GraphoGame.

By identifying teacher characteristics and how they affect the literacy of acquisition of learners, it was envisioned that Government would use this information to enhance teacher selection and training. It was hoped that this in turn would have a positive impact on the quality of first grade teachers in schools. It was further hoped that findings on the beliefs of Zambian first grade teachers would create awareness about the importance of understanding teacher beliefs. For the teachers, it was intended that the findings of this study may highlight the importance of understanding their own beliefs. For the Ministry of Education, it was expected that findings generated on teacher beliefs would have implications for policy, curriculum reform and teacher training. This study is significant because it focuses on both teachers and learner outcomes and not one at the exclusion of the other.

> "The way teachers adapt and adopt new practice in their classrooms relates to whether their beliefs match the assumptions inherent in the new programs or methods. Thus understanding teacher beliefs may be helpful to the development and implementation of new programmes and effective in-service education" (Richardson, Anders, Tidwell & Lloyd, 1991: 560).

1.6 Justification of the study

As imparters of knowledge, teachers are largely responsible for the quality and quantity of knowledge acquisition of learners. Sanders (1998) and Sanders and Rivers (1996) contend that teachers are the single most important factor affecting student achievement. They further explain that these effects on student achievement are both additive and cumulative. With regard to literacy acquisition, first grade teachers have the enormous task of ensuring that learners effectively acquire literacy skills. Early grade literacy skills are particularly important because they create the foundation on which other academic skills are built.

Stodolsky and Garrison (1995) explain that classroom practice of educators is informed by beliefs and personal theories held about teaching, learning and knowledge. They further clarify that beliefs about what it means to be a teacher and how students acquire knowledge constitute "personal philosophies" which are reflected in and guide practice. Furthermore, teacher beliefs inform the concepts taught, organization of teaching and learning material, instructional and assessment decisions. They also influence the manner in which teachers interact with learners. Teacher beliefs serve as a foundation for setting goals and standards thereby helping teachers focus their attention and energy on what is important. They are closely linked to strategies teachers use when coping with daily challenges in their professional life. The different kinds of beliefs made reference to in this study together provide a comprehensive perspective on beliefs in the typical learning environment. The interaction of teacher beliefs and characteristics with GraphoGame will serve as valuable information for future research and projects that will use GraphoGame.

1.7 Statement of the problem

Research conducted by the Ministry of Education reveals that the proportion of school children achieving even the minimal expected standard of literacy by Grades 5 and 6 is exceptionally low. Only 32% of learners attain minimal acceptable mastery of skills and knowledge (Ministry of Education, 2010). An evaluation of SACMEQ results for 2000 and 2007 in Reading in English showed that while an increase in reading levels was observed in other countries between 2000 and 2007, in Zambia the scores remained low. SACMEQ observed that Zambia is far from the SACMEQ mean score of 500. It is one of the lowest performing countries together with Malawi. Similar research results show that the performance of learners in reading and comprehension is consistently low (EGRA, 2012; MOE, 2010).

The MOE, 2012 examinations performance review acknowledges that evaluations conducted on the reading levels of Zambian learners, since the inception of PRP, show that improvements in reading levels that was observed in PRP pilot schools were not sustained. This is evidenced by the NAS findings of 2006 and 2008 and the SACMEQ results of 2007 (Ministry of Education, 2013). Clearly, Zambian learners are not performing as well as they should in reading despite the introduction of the PRP. In light of the above observation, the Reading Support for Zambian children (RESUZ) project was designed to assess and document the efficiency and effectiveness of a computer-based phonics game (GraphoGame) in improving the literacy levels of first grade learners and their teachers. Within the context of the RESUZ study, the current study attempted to explore the problem of low reading levels by focusing on the teachers.

More specifically, this dissertation sought firstly to explore what are the general characteristics of Zambian first grade teachers. Secondly it attempted to establish how these characteristics affect the reading acquisition of learners. An attempt was further made to establish the teachers' beliefs about the teaching curriculum (PRP), teaching approaches, motivation and their personal theories of teaching and learning. Furthermore, an attempt was made to determine how the characteristics and beliefs identified in this study impacted literacy acquisition and lastly if and how GraphoGame affected literacy acquisition of learners through the teachers. This study also conducted focus group discussions in order to obtain in-depth information on the various challenges faced by first grade Zambian teachers.

2 LITERATURE REVIEW

2.1 Teacher beliefs

2.1.1 The nature of beliefs

Over the years, various researchers have made an attempt to study and understand the nature of beliefs. Pintrich (1990) contends that although beliefs are the most valuable psychological construct to teacher education, very little research on teacher beliefs has been conducted. Different researchers have referred to beliefs in many different ways. Pajares (1992), referred to beliefs as a "messy construct". Clark and Peterson (1986) uses the term "implicit theories". Borg (1999) refers to them as "personal theories", Calderhead (1996) uses the term "untested assumptions", while Shultz, (2001) defines them as "perceptions". Breen, Hird, Milton and Thwaite and Oliver (2001) use the term "pedagogical principles".

This confusion in defining the term has been attributed to the fact that identical terms have been defined in different ways. Additionally, similar concepts have been used to describe different terms (Clandinin & Connelly, 1986). Pajares, (1992) contends that the confusion results due to a lack of distinction between knowledge and belief. While knowledge is conscious and often changes, beliefs may be unconsciously held, are often tacit and resistant to change (Nespor, 1987). Pajares (1992) further notes that "it is not argument or reason that alters beliefs, but rather a conversion or gestalt shift" (p. 311). Whether a belief is held consciously or unconsciously, the individual holding the beliefs will always accept it as true. Beliefs serve as a guide to thought and behaviour (Borg, 2001). They are formed as a result of an individual's education and experience (Johnson, 1994).

2.1.2 Beliefs and knowledge

Beliefs and knowledge are sometimes confused to mean the same thing. It is important to make a distinction between the two in order to understand how one contributes to the other. In the case of teachers, this distinction will clarify how their training knowledge impacts their beliefs and vice versa. Clark and Peterson (1986) acknowledge that teachers' theories and beliefs denote a wealth of knowledge. Teachers form an intricate organization of personal and professional knowledge. This organization enables them to make sense of their world and respond to it accordingly. Much of a teacher's professional knowledge can be more accurately regarded as belief (Kagan, 1992). Teachers enter the teaching profession with various types of already established beliefs about the teaching profession based on their cultural backgrounds and experiences. The professional training they receive may cement, challenge or alter these beliefs altogether. What is important to acknowledge is that teachers have a wide range and variety of beliefs related to teaching. Some of these can include beliefs the nature of their learners and the learning process, their roles as teachers, the characteristics and purposes of teaching, the role of parents in the education of their children, and so many other beliefs.

Literature indicates that beliefs serve to guide and direct behaviour (William & Burden, 1997). It is therefore important to first determine the types of beliefs teachers have, which serve to guide the behaviour and decisions they make and ultimately how these affect the learning outcomes of their learners. This study has chosen to focus on four main beliefs; beliefs about the curriculum, motivation, teaching approaches and personal theories of teaching, and how they influence of these beliefs on literacy acquisition. Kegan (1992) explains that as a teacher's professional experience increases, this knowledge is refined and increases in coherence. It then forms a highly individualized belief system that guides the teacher's perception, judgment and behaviour. Richards & Lockhart (1994) support the notion that beliefs serve as the background to much of the teachers' decision making and classroom actions. Pajares (1992) argues that beliefs are far more influential than knowledge in "determining how individuals organize and define problems and are stronger predictors of behaviour." (p. 311).

The preceding paragraphs have attempted to illustrate the nature of teacher beliefs and how they affect the teacher in the classroom. This highlights the need for teachers to understand their own beliefs. The subsequent paragraphs discuss in detail how teachers can understand their beliefs. They also highlight some of the challenges that may be experienced in the process.

2.1.3 Understanding beliefs

In order for teachers to understand their classroom practices, it is important for them to understand the beliefs that guide these practices. In order for them to understand their beliefs, they must be made aware of them. This is important especially because beliefs may be held unconsciously (Crandall, 2000).

Williams and Burden (1997) affirm that teacher beliefs play an important role in the teaching- learning process. For this reason, teachers must understand their own beliefs, theories or philosophy. It is therefore important that teachers maintain a constant process of personal reflection. Through this reflection, teachers come to understand their own implicit theories. These impact their professional practice (Williams & Burden, 1997). Whether teachers act spontaneously or out of habit, their actions are prompted by a deep-rooted belief that may never have been articulated or made explicit. The unconscious nature of beliefs is what makes them difficult to understand. However, it is important that teachers understand these unconscious beliefs. Only when they understand their beliefs will they take the necessary steps needed to make changes where necessary.

In line with the above notion, Richards (1996) appeals to teacher educators to assist teachers articulate their beliefs and use them to reflect on their teaching. This awareness of tacitly held beliefs will help teachers make the connection between their beliefs and classroom practices. This will then help teachers adopt new beliefs and practices. It is only by changing existing beliefs that instructional change can take place (Dwyer, Ringstaff, & Sandholtz, 1991). This is particularly important in situations where the curriculum is changed and teachers have to adapt to a new curriculum. Zambia has undergone several changes to the literacy curriculum since independence. This raises the need to ensure that the beliefs held about an earlier curriculum do not negatively affect the classroom implementation of the current one. For instance, it is possible that previous belief held about the importance of teaching literacy in English, could counteract the current policy that literacy should be taught in the local language. The teachers in the study were of varying ages and diverse work experience. They received their professional training on literacy teaching under different literacy instruction policies. Some were trained under the earlier policy when English was used as the medium for teaching initial literacy. Some of the teachers were trained under the current policy which emphasizes that literacy should be taught in one of seven local languages that is familiar to the learner.

It is possible that teachers' beliefs about how literacy should be taught was influenced by the policy that was prevailing at the time they received their training. With this background in mind, it is plausible that the beliefs and knowledge attained by teachers during the earlier policy could be confounding with the knowledge they have acquired under the current policy. Therefore this study sought to determine what the teachers' beliefs regarding the current teaching curriculum are and how the beliefs impact on literacy acquisition of learners. This study went a step further to establish the beliefs of first grade teachers in motivation, teaching approaches and personal theories of teaching. Since most of these beliefs are a result of the professional training teachers have received, the findings of the current study will provide some insight into the coverage of these areas during teacher training.

Pajares (1992) argues that beliefs are unlikely to be replaced unless they prove unsatisfactory. In order for beliefs to be proven unsatisfactory, they must be challenged. Due to the important role that beliefs play in the creation of one's identity, they can be very difficult to change. Apart from helping the individual form their individual identity, beliefs help individuals form groups, social systems and identity with one another. People grow comfortable with their beliefs, and these beliefs become their "self" so that individuals come to be identified and understood by the very nature of the beliefs, the habits they own (Pajares, 1992, p. 317).

Culturally and socially, beliefs provide a form of structure, order, direction and shared values. At a more personal level, they reduce dissonance and confusion, even when dissonance is logically justified by the inconsistent beliefs one holds. This explains the emotional dimensions attached to beliefs. Nisbett & Ross (1980) suggest that with time, beliefs acquired earlier in life become enshrined thereby making them more difficult to change. Woods (1996) further suggests that the more central the belief is to the individual, the more difficult it will be to change it. In order for teachers to shift their beliefs to accommodate new ones, they would be required to abandon well-established and seemingly successful practices for new practices. As Governments change from one education policy to the next, the difficulties teachers experience in trying to change their beliefs accordingly, is not fully appreciated. The dissonance in beliefs that teachers experience when new educational policies are imposed on them can take a long time to resolve (Woods, 1996).

2.1.4. Beliefs about the curriculum

Teacher beliefs about academic content especially in relation to status, stability, sequence and scope shape their practice (Grossman & Stodosky, 1995). These beliefs inform the concepts taught, the way the material is ordered and organized, student understanding and misunderstandings they anticipate and their instructional and assessment decisions. Literature on teacher beliefs about the curriculum is scarce. However, some studies have been conducted on the reforms of curriculum. Many studies have reported that curriculum reforms were usually unsuccessful in meeting their goals. Westbrook et al. (2013) explain that teachers are often enthusiastic about new curricular approaches. However, in many cases they lack adequate knowledge and support on how to implement the curriculum. Several studies found curriculum reform was often overloaded with content, with an implementation pace that was too fast for the majority of students who were then left behind (Ottevanger, De Feiter & Van Den Akker, 2007; Paine & Fang, 2006; Pillai, 2003; Rogan & Grayson, 2003).

O'Sullivan (2002) explains that the introduction of new curriculum must be supported with scaffolding and support, in whose absence teachers resort to traditional, entirely directive curricular approaches. Westbrook et al. (2013) acknowledge that mismatches between teacher training and curriculum used in the classroom can lead to poor implementation of the curriculum. One of the ways in which this mismatch can be avoided is by consulting widely with

teachers and teacher institutions. Several studies have reported a lack of teacher involvement in curriculum planning. This had left teachers subjected to a top-down process, a lack of understanding of the reforms' intentions, and the reforms themselves lacking practical input on the realities in the classroom (Lai, 2011; Rogan, 2007). Zambia has undergone several changes to the literacy curriculum in the past decades. Change was also necessitated by the need to improve literacy levels in the country.

More recently, the use of the local languages has been championed as a solution to this problem. The Malawi Government/ Ministry of Education took a similar stance as Zambia in this regard. MacJessie-Mbewe (2004) reports that efforts to localize the curriculum in Malawi have been unsuccessful, partly due to the lack of support by teachers. Likewise in Zimbabwe, teachers dismissed indigenous knowledge and privilege that was proposed for different subject areas, in preference for text book knowledge (Shizha 2007). These two findings highlight the need to involve teachers in the process of curriculum reform. Their support is vital to the successful implementation of any curriculum.

2.1.5 Beliefs about the teaching approaches

The process of teaching is interactive. Knowledge and skills are shared and transferred with a view to improving students' understanding and ability to influence the social, economic, political and physical environment in order to enhance their survival (Brown, Oke & Brown, 1970; Flandres, 1970). The ultimate goal is to bring about desirable learning. The responsibility of teachers is to initiate this process using the syllabus as a guide. Ultimately, the idea is to influence the ways in which learners think. The approach used by teachers to do this is a matter of choice. While the training received by most teachers makes recommendations in favour of participatory- exploratory approaches, the choice of approach is often influenced by cognitive orientation such as beliefs in conjunction with the objectives of the teaching-learning process (Flanders, 1970). Poor instructional methods have been associated with poor performance (Kang'ahi, Indoshi, Okwach, & Osodo, 2012; Muraya & Kimano, 2011).

In the teaching process, teachers make reference to two main approaches in the classroom, behaviourism and constructivism. The former view assumes that children do not develop through their own efforts. They believe development consists of learning sets of relatively passive responses to environmental stimuli such as the teacher. Beliefs associated with this view include ideas that children are not intrinsically motivated to learn and that their recollection of pieces of knowledge given to them by the teacher is a valued developmental outcome. The latter (constructivism) argues that learning occurs when a learner actively constructs meaning from elements in the environment. This central idea behind constructivism, that human learning is constructed, that learners build new knowledge upon the foundations of previous learning, conflicts with the key tenet of behaviourism – that reception, rather than construction leads to learning (Hoover 1996). The subsequent paragraphs discuss these views in more detail.

The behaviourist view encourages teachers to take responsibility for the children's learning. However, Piaget warns of the dangers of teaching children to simply reproduce others' thinking. Instead, teachers are urged to utilize children's natural curiosity to foster their creativity, inventiveness and critical thinking. The general conclusion from research on teacher cognition is that many prospective teachers lean towards a behaviourist perspective (Clark & Peterson, 1986; Hollingsworth, 1989), believing that learning occurs through didactic instruction. Those beliefs are stable over time (Pajares, 1992) despite educational efforts to change them (Richardson, 1996). Many psychologists and educators are concerned about this state of affairs because such beliefs lead to classroom practices and child outcomes not currently favoured. Such practices do not prepare children to function in the information age.

These concerns are warranted. Research shows that teachers' beliefs in traditional education approaches are consistent with their frequent use of didactic practices in the classroom (Stipek & Byler, 1997; Stipek, Milburn, Galluzo & Daniels, 1992). In some circumstances, children learn more basic skills (e.g. number and word recognition) in programs emphasizing didactic rather than child-centred approaches (based on constructivist views (e.g. Schweisfurth & Weikart, 1988). Therefore teachers who value content knowledge and skills can accomplish these goals through didactic instruction. However, research has shown that compared to children in child-centred classrooms, children in didactic classrooms have lower motivation, less perceived competence, and more negative attitudes towards school (e.g. Stipek, Feiler, Byler, Ryan, Milburn, & Salmonl, 1998; Stipek, Felier, Daniels & Mulburn, 1995). More importantly those costs do not appear to be outweighed by impressive, long term gains in achievement in basic skills (Stipek et al, 1998).

Research has also shown that teachers' constructivist views of the child's mind are consistent with their (child centred) educational practices (e.g. Rhine, 1998). Some research shows that such practices foster valued child qualities such as motivation to learn and problem-solving. For example studies show that preschool and kindergarten teachers who endorse child-centred practices are more likely to use a variety of engaging, authentic activities in their classrooms (Stipek & Byler, 1997; Stipek, Daniels et al., 1992; Stipek, Milburn et al., 1992). Other studies also demonstrate links between constructivist views of the mind and use of activity-based instructional approaches (e.g., Duckworth, 1987; Peterson, Fennema, Carpenter, & Loef, 1989). Some studies have produced compelling results that educational programs based (at least to some extent) on constructivist views of learning encourage child valued outcomes. For example, children in child-centred programs demonstrate greater motivation to learn (Stipek et al, 1995), lower anxiety (Hart et al., 1988) and high problem solving and language skills (Stipek et al., 1998) than children in didactic programs. Similarly, some evidence suggests that children in constructivist-based science classes ask more creative questions and persist longer on projects than children in traditional science classes (e.g., Duckworth, 1987).

In his study of 259 pre-service teachers, Klein (1996) found that behaviourism and constructivism are not represented as a dichotomy for teachers. Both paradigms are visible to some extent in many teachers. Similarly, in a study of in- service teachers involved in a staff development programme, Collinson (1996) found that though teachers may adopt various principles of behaviourism and constructivism, one of these paradigms was always more dominant. Thus, while some teachers were concerned about the need to "cover the curriculum", others were more interested in "integrating the curriculum" and "finding the kid's level" (p. 11).

Such views about teaching and learning are in part related to the shared values and beliefs of the culture that the teachers belong to (Kennedy & Kennedy 1998). Following the work of Hofstede (1991), Kennedy & Kennedy (1998) describe how national cultures and behaviours can affect pedagogic beliefs and classroom cultures. For example, a distinction is made between countries with large power distance measures (where power is concentrated in the hands of a few) and small power distance measures (where power is less hierarchical and more decentralised). They argue that in cultures with large power distance, a transmission view of education (Barnes 1976) is most likely to be upheld with beliefs that the teacher should be in authority, in control of the classroom dynamics, and in control of the knowledge. In contrast, in cultures at the other end of the continuum, the power distribution in the classroom would be different, with the teacher playing a facilitative rather than the authoritative role.

Schweisfurth (2011) conducted literature review on various research carried out in developing countries on Learner Centred Education (LCE) that were published in the International Journal of Educational Development. She identified 72 articles that covered the nature and implementation of learner centred education. The aim of the research was to identify areas of concern with regard to implementation of LCE and how these can be overcome. The articles she reviewed were written about various developing regions of the world. All the articles highlighted pedagogical, assessment and curricular implications as discouraging the use of teacher centred education. Some authors referred to as "didactic", "frontal", or "chalk and talk" rote type learning (p.426). Various terms were also used to refer to LCE. These included "constructivist", "progressivist" principles, while others referred to terms that were locally used for examples the term "outcomes-based education"(OBE).

The article reports a wide range of learner centred pedagogical practices. It also includes the many different strategies that were used to introduce them into classrooms. Schweisfurth (2011) observes that most strategies used the top-down approach to introduce the use of LCE in classroom. This was mainly done through the use of educational policies and reforms. She explains that this kind of approach imposes the use of LCE onto the teachers. Teachers then feel obliged to be seen to use these practices in the classrooms. A resonating theme in these articles related to teacher education. Teachers can be prepared to use learner centred practices at various levels of education. Although the articles

focused on various subjects, the teaching of language and science received the most attention. The main topics that were raised with regard to language centred on language of instruction and communicative language teaching. She makes reference to an article by Altinyelken (2010) who notes that teachers that use English as a second language find it difficult to avoid frontal teaching. This is due to their lack of skills in the language. They feel the need to control classroom conversation, therefore enabling them to stay within their comfort zones.

Most of the studies reported in the article are small scale studies that used qualitative methods of research. Interviews and questionnaires were the most common forms of data collection. Some classroom observations and occasional ethnographic studies were reported. An article by O'Sullivan (2006) emphasizes the need to use classroom observations as a means of understanding what exactly teachers do in the classroom. O'Sullivan further notes that relying on teachers' self-reports is not adequate. This is so especially when there is motivation for self-protection or when teachers lack depth of understanding certain definitions and expectations. While some reference was made to teachers in the context of LCE as well as influence of culture, teacher dispositions or beliefs have been excluded as possible factors in either the successful or unsuccessful implementation of LCE. The article makes no reference to the opinions of teachers on the use of LCE.

Empirical data on teaching approaches

Anderson-Levitt (2004) conducted a study in which she observed teachers delivering reading lessons in three countries; Guinea, France and the United States. A comparison of first and second grade reading lessons was then conducted. The objective of the comparison was to discover whether the teaching practices of the teachers had any similarities. Data was collected using participant-observations and teacher interviews. In France the researchers visited 55 classes, including 34 first grade classes from 1976 to 1998. Classroom visits took place in 32 different primary schools in a range of urban, suburban and rural neighbourhoods. In Guinea three provincial towns and two rural villages were visited. In total 11 first grade and 9 second grades in 11 different primary schools were observed. In the United States data was collected through the use of author descriptions of actual naturally occurring lessons.

The study revealed that in all three countries the mixed method of teaching was used. However, what constituted mixed method differed from one country to the next and even within countries. This was observed from the different lesson structures that were prepared by the teachers. Teachers from the United States had no predictable sequence of activities in their lessons. Instead, they preferred a loose flow of activities within the classrooms. On the other hand French classrooms were more focused and activities in the classrooms were aimed at achieving the goal for that particular lesson. Guinean lessons were very similar to lessons in France. The similarities between these two countries could be attributed to the fact that Guinea was once a French

colony. Although similarities existed, some differences were noted. In Guinean lessons, the emphasis on synthesis was not present.

The study further revealed that amongst the three countries, differences were noted in what constituted comprehension. In France and Guinea, comprehension of the lesson preceded reading of text. In the United States comprehension work followed reading the text. Furthermore, differences were also observed in the use of instructional tools. The United States used individual books in students' hands whereas in Guinea and France texts written on the chalkboard were preferred. The instructional tools used were closely linked to the social-organization of the classroom. Guinean classrooms preferred the whole-class instruction method. This was motivated by pragmatic reasons as classrooms usually had a large number of learners and limited books. The use of individual books in the US context also reflected their cultural values. They preferred the child centred learning approach. Although the Ministry of Education in France has promoted the use of ability groups, the researcher noted that teachers opt for the whole class method as it promotes teachers' values of equality and equal treatment.

The findings of this study highlight the different ways in which teachers conceptualize the learner centred, teacher centred approach and a mixture of the two. The decision to choose one method over the other or a combination of both is based on the cultural orientation of the countries that is whether it promotes learner-centred or teacher centred approach. Additionally, the availability of learning and teaching materials influences the choice of classroom activities. Each country has a uniquely distinct approach to teaching reading. This gives meaning and significance to each of the different contexts (Anderson-Levitt, 2004). Various factors such as cultural contexts of the societies, the challenges faced by these societies, the individual ways in which the teachers plan and deliver their literacy classes and the number of learners in the classroom can influence the decision to choose one teaching approach over another. This paper highlights some of these important factors. However, it does not analyse individual teacher aspects such as characteristics and beliefs that also have the potential to influence the choice of teachers' teaching approaches. Although some studies have been conducted on the impact of these factors on the performance of learners (Stevenson & Stigler, 1992) research studies are yet to be conducted in Zambia.

Odundo and Gunga (2013) conducted a study to determine the effect of different instructional methods on the achievement of secondary school students in business studies. The sample consisted of 288 form four business students across Kenya. Probability and nonprobability sampling techniques were used to select the students and the teachers. Data collection instruments included a survey questionnaire for learners, an interview schedule for teachers and classroom observation guides for teaching and learning processes. Both quantitative and qualitative methods were used to process, analyse and interpret the data. Results from this study revealed that learning achievement was associated with teacher-centred instructional methods, including lectures,

dictation and chalkboard notes as well as learner-centred approaches through group discussions, take-away assignments and brain storming. The study confirmed that learner centred instructional methods accounted for large proportion of variance in the performance of students studying business.

Odundo and Gunga (2013) concluded that learner-centred methods are more effective in enhancing learning achievement in business than teacher centred approaches. Results similar to the study conducted by Odundo and Gunga (2013) were also obtained by Muraya and Kimano (2011) and Kang'ahi, Indoshi, Okwach and Osodo (2012). Kang'ahi et al (2012) sought to establish the influence of teaching styles on learners' achievement in Kiswahili in secondary schools. The study established a positive relationship between teaching styles and the academic achievement of learners. An increase in learning achievement was observed for learners in classrooms in which teachers practiced learner-centred teaching styles.

The focus of the studies by Odundo and Gunga (2013) and Kang'ahi et al (2012) are important in the context of the current study because they focus on learner-centred and teacher centred approaches. More importantly, they focus on what impact these approaches have on the learning achievement of learners, which is also the focus of the current research. The study by Odundo & Gunga (2013) focuses on secondary school learners studying business. Kang'ahi et al (2013) is concerned with Kiswahili language in secondary schools. However, the present study is concerned with first grade learners of literacy. While these studies are useful because they shed light on the possible effects of teaching approaches on learning achievement, the samples are different from the sample in the current study. Therefore, the current study will attempt to provide information on the effects of learner and teacher centred learning approaches as they relate to reading acquisition of first grade learners.

2.1.6 Beliefs and motivation

In order to link motivation and beliefs reference can be made to the connection identified by Schraw, Crippen and Hartley (2006). They note that from a metacognitive perspective, motivation is defined as "beliefs and attitudes that affect the use and development of cognition and meta-cognitive skills" (p. 112). Motivation may also be broadly defined as "the attribute that moves us to do or not to do something" (Broussard & Garrison, 2004, p. 106). Different individuals exhibit different levels (intensity of motivation) and types (orientation) of motivation. Watkins (2000), states that one of the five key elements associated with quality education is motivated teachers. He further emphasizes that the efficacy of education anchors on motivated teachers, without which education quality and ultimately socio-economic development will be stifled. Education and development cannot be divorced from each other.

Motivation consists of a combination of beliefs, perceptions, values, interests and actions that are all closely linked (Lai, 2011). For this reason approaches to motivation can be focused on different perspectives; cognitive behaviours (monitoring and strategy use) or non-cognitive aspects (attitudes,

beliefs and perceptions) or a combination of the two. While it is true that motivation has been widely studied in education, teacher beliefs regarding their motivation is an area that is yet to be explored. For this reason, this section will focus, not on teacher beliefs regarding their motivation, but on teacher motivation (intrinsic and extrinsic) and how it impacts literacy acquisition. The different types of motivation are distinguished by the goals or reasons that give rise to the behaviour (Ryan & Deci, 2000). There are two main types of motivation; intrinsic and extrinsic motivation. The former refers to motivation that comes from within the individual. The individual performs an action because it is inherently enjoyable for the individual and produces some psychological benefit (Ryan & Deci, 2004). The latter refers to motivation that is governed by reinforcement contingencies. It involves doing something because of the external rewards attached to the behaviour.

Intrinsic and extrinsic motivation

Intrinsic motivation was first discovered during experimental studies of animal behaviour. It was observed that animals engage in exploratory, playful and curiosity driven behaviour's even when reinforcement and rewards were absent (White, 1959). Ryan and Deci (2000) acknowledge that intrinsic motivation is a crucial element in the social, cognitive and physical development of human beings. They further explain that individuals develop, and grow in skill and knowledge by performing tasks that are inherently interesting. A high correlation is known to exist between intrinsic motivation and teaching. The internal desire to educate people, to give knowledge and value is seen as a vocational goal in teaching. This kind of motivation enhances learners' educational process and attentiveness in the classroom (Wild, Enzle, Nix & Deci, 1997).

Various researchers have explored the basic needs that are satisfied by intrinsically motivated behaviours. Ryan and Deci (2000) proposed an approach that focuses on the fulfilment of psychological needs for competence, autonomy and relatedness. In the teaching profession, the educational process, which involves the teachers' interactions with the learners and the observed changes that occur as a results of this interaction, can intrinsically motivate the teacher. Interest in a particular subject, which then leads to an increase in the teachers' professional knowledge and skills, can reinforce intrinsic motivation. Wheatley (2000) makes reference to "teacher efficacy" as an important component in teacher intrinsic motivation. He defines teacher efficacy as beliefs that teachers have about their ability to influence student outcomes (Wheatley, 2000). Two main ways have been proposed for the measurement of intrinsic motivation; the free choice measure (Deci, 1971) and the use of self-report of interests (Harackiewicz, 1979; Ryan, 1982;). Free choice measure is mostly used in experiments in which individuals are exposed to tasks under varying conditions. After a varied amount of time, the individual is informed that they no longer need to continue work on the task. The experimenter leaves the experimental room with various distractors, at which point the participant has

"free choice" to continue work on the task or not. If the participant continues work on the task, it is assumed that the individual is intrinsically motivated. In self-reports of interests, researchers rely on task specific measures. Other researchers prefer domain focused measures, for example one's intrinsic motivation for school (e.g. Harter, 1981).

Although intrinsic motivation is an important type of motivation, extrinsic motivation is also important. Researchers argue that extrinsic motivation can vary to the degree that it is self-directed. It is sometimes dependent on other instrumentalities such as reactions from significant others or the impact it might have on an individual's goals. Deci and Ryan (1985) note that many educational activities are designed to be extrinsically motivating. It is therefore important that learners are motivated to value and self-regulate such activities. They propose that this can be done by fostering internalization and integration of values and behavioural regulations.

Internalization is the process of taking in a value or regulation. Integration is the process by which individuals transform the regulation into their own so that it emanates in their sense of self (Deci & Rayan, 1985). An increase in internalization and integration will help ensure greater persistence, a more positive self-perception and better quality of engagement for the extrinsically motivated individual. Extrinsic motivators related to a job consist of tangible benefits such as salary, fringe benefits and job security. Extrinsic motivation is also connected to physical conditions in which the work is being conducted, the amount of work and the facilities available to get the job done. Other than extrinsic and intrinsic motivation, the teachers' motivation can also be affected by contextual factors.

Contextual or environmental factors play an important role in job motivation. This refers to the work itself, which can have a great influence on persistence and performance. Two main types of contextual factors that influence teacher motivation are commonly referred to; macro-contextual and micro-contextual. The former motives are related to teaching, as the job is expected to fulfil greater societal duties such as creating responsible citizens who will be the future leaders. This means that every level of society has an external influence on the teaching process and its outcomes. The latter motives are concerned with the organizational climate of the school where the teaching takes place, the class, the classroom environment and the learners. From the micro-contextual perspectives, teacher motivation is affected by factors such as the general school climate and existing school norms, class sizes, availability of teaching and learning resources, the definition of the teachers' role by colleagues and authorities, expectations regarding student potential, the school's reward contingencies, feedback system and the school's leadership and decision making structure (Dörnyei, 2001).

Various theories of motivation have been used to explain the how, when and what of motivation. Johnson (1986) identified three main theories of motivation and productivity that teacher motivation is based on; expectancy theory, equity theory and job enrichment theory. The first two theories focus on

reward for work while the last one focuses on personal satisfaction and potential career progress. Two main factors that affect the performance of teachers' work are context factors and work content factors.

The former refers to factors that are extrinsic to the teacher. These include working conditions such as class size, discipline conditions, availability of teaching and learning materials, quality of supervision, basic psychological needs such as status, money and security. These factors prevent dissatisfaction on the part of the teacher. However, these factors may not have an extended motivational effect or lead to improved performance or quality teaching. Studies have shown that these factors, for example, teacher compensation, supplemental income, and benefit, did not correlate with long term satisfaction and teaching as a career (Snyder, Hoffman & Geddes, 1997). The latter (work content factors) consists of factors that are intrinsic to the work itself. They include opportunities for professional development, recognition, challenging and varied work, increased responsibility, achievement, empowerment and authority. The subsequent paragraphs will explain the theories of motivation in detail.

Theories of motivation

The equity theory focuses on the concept of fairness. It examines the tendency of employees to compare the fairness of what the work requires them to do (input) with what they receive in exchange for their efforts (output). It suggests that staff members compare their own job situation with that of another person. If equity is not experienced, they will take actions they feel that will bring about equity between their inputs and their outputs. The theory proposes that perceptions and not facts influence motivation (Schermerhorn, Hunt & Osborn, 1997). Unfair treatment for employees' efforts and achievements can demotivate them.

The expectancy theory attempts to explain the determinants of workplace attitudes and behaviours (Wagner & Hollenback, 1998). Three major concepts underline this theory; valence, instrumentality and expectancy. The theory proposes that motivation is determined by the individual's beliefs in their own efforts, the resulting job performance and the outcomes or rewards and incentives offered for the job performance. The performance outcomes provide information to support a person's beliefs. These beliefs then affect the future motivation of the individual. Motivation is determined by (1) the expectancy that effort will result in performance, high levels of effort are expected to be reflected in high levels of performance; (2) the expectancy that performance will result in rewards. Motivation will be obtained from the belief that performance will lead to outcomes. If this belief is not present, performance will be negatively affected. (3) Valence or personal value placed on the outcome they believe they will receive based in their performance. High valence of outcomes leads to high motivation and vice versa. These three factors collectively determine the motivation of an individual.

The theory proposes that all three factors must be high in order for motivation to be high. Through the use of this theory leaders can try and increase the beliefs that employees are capable of performing the job successfully. This can be done by selecting teachers with the necessary skills and knowledge to teach specific subjects, provide coaching to teachers who lack the confidence or the skill to perform their jobs, alleviate any problems that will have a negative impact on the performance of the teacher and be open to suggestions from teachers on how their jobs can be improved. School managers can also try to increase the belief that good performance will result in valued rewards. In order to do this, schools managers should put measures in place that will help measure job performance accurately, explain the reward mechanism used in the school and use other teachers who have performed well and have been adequately rewarded as role models that other teachers can emulate. School managers can also try and increase the expected value of reward resulting from desired performance. This can be achieved by distributing rewards that the teachers will value and appreciate.

Maslow (1954) proposes a theory of motivation that arranges human needs in hierarchical order from the lower to higher order needs. He refers to the lower needs as deficiency needs because people are motivated to meet these needs, which facilitate movement to higher order needs (growth needs). Deficiency needs include (1) physiological needs (water, food, shelter) (2) security and safety needs (stability, financial security, freedom from physical threats or danger) (3) belonging needs (affective relationships, need to belong, to love and be loved) (4) status and self-esteem needs (the need to be valued, respected by the self and significant others). Growth needs include the need for self-actualization. This refers to the need to fulfil ones potential and to develop one's capacity.

Maslow's theory highlights the fact that jobs that individuals perform can fulfil both deficiency and growth needs. Teachers should feel secure in their jobs. The salaries they receive should help cater for all their physiological needs. Teachers should feel a sense of belongingness with the schools and the entire education system. In this regard feedback from fellow teachers and administrators will help confirm this sense of belonging. Fulfilments of status and self-esteem needs within and outside the school environment is also important. Teachers who do not feel respected can become discouraged and demotivated. Everyone wants to be recognized for their accomplishments within their schools. This need can be met by promotions, medals and bonuses. Satisfaction of these needs can lead to self-confidence and a sense of gratification. Research conducted on this theory reveals that self-esteem needs are an important motivator that school managers and educators should be concerned with (Owens, 1995).

Frederick Herzberg's two factor theory distinguishes two sets of work factors (Herzberg, Mauser & Snyderman, 1959). The first set of factors relate to the work itself, referred to as motivators or satisfiers. The second set of factors relate to the work environment, referred to as hygiene or dissatisfiers. The

theory posits that employees are not motivated by external factors such as salary, work conditions, policies and administrative practices, interpersonal relationships and job security. Instead intrinsic factors such as achievement, recognition, meaningful work, opportunities for growth and advancement and responsibility are the major motivators. Researchers have noted that if appropriate hygiene factors are provided, employees will not be dissatisfied, but neither will they be motivated to perform at their full potential (Eimers, 1997; Jones, 1997; McKenna, 2000). Motivators produce real motivation. Hygiene factors are prerequisite for motivation (Eimers, 1997; Owens, 1995). Owens (1995) distinguishes between educators as motivation seekers and hygiene seekers. He found that motivation seekers showed greater commitment to teaching than hygiene seekers.

The theory can be practiced in the field of education. Owen (1995) suggests that education managers should be concerned with ensuring that the causes of dissatisfaction are removed and that opportunities for satisfaction are increased. He elaborates on this point by stating that employers cannot satisfy employees by merely increasing their salaries or giving them transport money. These things reduce dissatisfaction but do not bring about satisfaction that will motivate workers. They are needed in sufficient amount only to ensure that motivation will not be affected. A balance between the factors is important. Achievement, recognition, work, responsibility, advancement and possibility of growth are important hygiene factors that should be balanced with good organizational policy and administration, good supervision, good salaries, status, job security, good interpersonal relationships with superiors, peers and subordinates.

Empirical research

Intrinsic and extrinsic motivations are both essential for teachers and learners. Researchers argue that encouraging motivation in children is crucial because it is a predictor of motivation later in life (Broussard & Garrison, 2004). Research also shows that the stability of this relationship increases from ages 8-9 years (Gottfried, 1990). A relationship between motivation and achievement in reading and math has been established (Broussard & Garrison, 2004; Gottfried, 1990; Lange & Adler, 1997). This is particularly true for learners who are intrinsically rather than extrinsically motivated. It has also been linked to critical thinking (Ennis, 1985; Facione, 2000; Halpern, 1998; Paul, 1992;) and metacognition (Schraw, Crippen, Hartley, 2006; Turner, 1995).

For the teacher, motivation is important not just for teaching performance. Teacher motivation has ramifications on the motivation and performance of the learners. From the teachers' perspective, motivation is important because it ensures that the time spent in school is fulfilling for the teachers. Motivation helps stimulate appropriate behaviour (Ofoegbu, 2004) required to ensure that teachers perform their duties diligently (Davidson, 2007). Teacher motivation is reflected in a teachers' attitude towards their teaching duties and related behaviour (Kocabas, 2009). These attitudes and behaviours can influence

learners' beliefs and attitudes towards school in general or a particular subject (Debnath, Tando & Pointer, 2007; Cuban, 1996). Therefore teacher motivation can influence learners positively or negatively. Teachers with low motivation are likely to produce low quality students (Mertler, 2002). Low morale in teachers has negative effects on student learning and the health of teachers (Moloi & Bush, 2006; Mertler, 2002). Teachers with high motivation are likely to cultivate values that will nurture intrinsic motivation in the learners (Adlerman, 2004; Mendler, 2001).

Davidson (2007) notes that teachers' dedication to duty and a willingness to continue in the profession is dependent on how satisfied teachers are with their work and the working environment that makes it either easy or difficult to accomplish tasks. In the case of Tanzanian teachers, he notes that motivation is mostly linked to the kind of treatment teachers perceive they are receiving as well as their working and living conditions. In his study, he observed that teachers were dissatisfied with the mismatch between their salaries and important needs; inability to send children to school; poor living conditions and limited access to health care. Yong (1999) has made similar observations for teachers in Burundi. He noted that teacher motivation and career commitment are amongst the important factors that affect school effectiveness. Burundi teachers indicated that they find their job too stressful and too demanding. However, many of them indicated that they were committed to their jobs because they loved working with children and desired to impart knowledge.

Information provided in the above paragraphs confirms that teacher motivation can be both intrinsic and extrinsic. According to Ofoegbu (2004) intrinsic motivation is necessary for effective teaching, while extrinsic motivation is created for the purpose of school improvement by giving incentives for work done. Performance based awards for teachers serve the purpose of extrinsically motivating the teachers. Ofoegbu (2004) observes that extrinsically driven teacher motivation aims to make teachers happy, satisfied, dedicated and committed to bring out their best in their places of work. Pay is equally important as it serves as a measure of teachers' worth (Yong, 2002).

Nkechi (2012) conducted a descriptive study to investigate (1) the level of teacher motivation, (2) the association between teacher motivation and (3) language learning and teaching amongst Nigerian teachers in Oyo and Lagos states. The study also sought to identify the factors that could impact teacher motivation. A student questionnaire was administered to primary and secondary schools students. The teacher Likert scale questionnaire was administered to primary school teachers only. The data collected was analysed using descriptive statistical analysis. Results revealed that 62.5% of the teachers in Lagos and 52.5% of Oyo disagreed that they were adequately motivated to teach. Nonetheless, 81.3% in Lagos and 98.9% in Oyo indicated that they were happy to continue teaching. According to Nkechi (2012), this finding suggests that the Nigerian teachers in this study were intrinsically motivated. He further suggests that this motivation is what keeps the teachers going when external factors fail to drive their teaching.

The factors identified as contributing to teacher motivation include professional development; the role of the school administration and the physical environment in which they work. With regard to professional development, the teachers considered this important because they felt this was the best way of obtaining a promotion. Their second choice of school administration was related to the fact that the teachers felt that the level of administrative and supervisory visits was commendable. However, they felt that the needs they expressed to management were not adequately responded to. With regard to the physical environment in which they work, the teachers' responses suggested a demoralizing work environment in both states. Overcrowding was a major concern for teachers (approximately 96 learners in class), lack of furniture in the classrooms and dilapidated infrastructure. Teachers' and learners' perception about the availability of books differed. While 42.8% of teachers indicated they had adequate books, 64.7% of learners believed they did not. The teachers' belief in their self-efficacy (belief in their efficacy to execute their duties) was high (97%). The teachers believe they were adequately trained to teach English. However, they indicated that they need more training.

Nigeria, like Zambia has experienced poor learner performance in reading. Nkechi (2012) attempted to make a connection between teacher motivation and learner performance. Nkechi (2012) noted that while teachers report that they are intrinsically motivated, factors in the education system have not improved sufficiently to drive teacher motivation and improve student performance. He observed that while the Nigerian Government has made an effort to increase teachers' motivation through increased salaries, this alone was not adequate. Many other factors important to teacher motivation had been underestimated. The study also concluded that teacher motivation could predict learner performance. Nkechi (2012) further notes that the findings of the research underscore the importance of supporting and evaluating Government policies with research findings. He explains that education managers' assumption about teachers and the education system need to be validated through research. He emphasized the inevitability of involving teachers in decision making on matters that concern them, their practice and the welfare of the entire education system. Teachers should be involved in planning development and change as this is likely to boost their motivation (Nkechi, 2012).

Marston (2010) conducted a study in which she compared elementary teachers from two districts in Pennsylvania, high school teachers from a Northern California district and professors from the same district in order to identify factors that motivate them. She asked to them to rate 18 factors under the categories of professional, practical and social that influenced their motivation to continue teaching. She also conducted interviews with the teachers. Results showed that elementary teachers rated having a good administrator highly in comparison to the high school teachers and professors. Teachers at all three levels indicated that they derived satisfaction in working

with students and satisfaction at seeing students learn and grow. High school and professors indicated that they derived joy from teaching in comparison to elementary teachers. Marston (2010) explained the differences that arise between the elementary teachers could be related to the fact that elementary teachers teach their students in all the subjects, hence the love for their students in general. Professors and secondary school teachers teach one subject only to their learners, hence their enjoyment of the teaching process. They are teaching a course or subject they already like. Factors such as salaries and teaching schedule were scored lowest. She explained that the reason for this is that in general teachers are not highly paid. She concludes that extrinsic motivators are not very important to teachers in the study.

Kocabas (2009) conducted a study in Turkey to determine to what degree various motivation sources motivate teachers. Teachers were asked to respond by indicating "always" or "never" to questions that were addressed to them. Results from this study also revealed that intrinsic motivation was the main factor motivating teachers. Kocabas (2009) notes that all the teachers responded "always" to the statement "My students being successful motivates me". This response, according to Kocabas, shows that seeing their students succeed was a great motivator for the teachers. All the teachers responded "always" to the question "Enjoying my job motivates me" and "Having a respectable status in society increases my motivation". These statements also refer to intrinsic motivation.

Responses to the above questions support the fact that intrinsic motivation is a far higher motivator than extrinsic motivation. A comparison between males and females in this study further revealed that the female teachers responded "always" to the questions "My success being recognized motivates me" and "being regarded as a role model motivates me" more than male teachers. Based on these responses Kocabas (2009) concluded that female teachers like to be recognized as it gives them a sense of power. He further observed that there are more female teachers than male teachers. A possible explanation for this is that becoming a teacher for females gives them a sense of dominance and control (Kocabas, 2009). He concluded that intrinsic motivation, like seeing the success of their learners, is the main reason why teachers are in the teaching profession.

Sinclair (2008) conducted a study with student teachers in colleges and universities in Australia to establish their initial and changing motivation and commitment to teaching. The study was also conducted to determine how many teachers changed their professions and why. Eleven motivational factors were used in this study, six intrinsic and five extrinsic. Interviews were conducted by administering open ended questions in order to establish what motivates or demotivates them. Sinclair (2008) observed that the student teachers were statistically significantly motivated to be teachers by intrinsic rather than extrinsic motivations. She noted that factors like working with children, intellectual stimulation and self-evaluation received the highest mean scores. Interviews with the teachers revealed that many of the participants

revealed that their love for children had grown since they started the teaching program. Others mentioned that it affirmed their career choice. The few teachers that decided to leave teacher training explained that they did not like working with children. Furthermore, they could not cope with the amount of work, stress and difficulties experienced during the training.

Qualitative data collected from the above mentioned study revealed that almost all the student teachers experienced increased motivation and commitment to teach. In addition, they confirmed their career choice during the training period. Sinclair (2008) explained that those who did change their career choice during this period did so because of unrealistic perceptions they had about work hours, vacation and working with children. The study concluded that intrinsic motivation is the greatest motivation factor for teachers. The findings of this study help to give some insight into the reasons why teachers decide to enter the profession. This knowledge is very important because the reasons for becoming a teacher can influence the motivation and commitment to continue being a teacher. This fact has been established by the literature that has been presented in this motivation section. In Zambia, screening for intrinsic motivators for would be teachers are not conducted before or during the teacher training period. One of the main objectives of this study is establish whether first grade Zambian teachers are either intrinsically or extrinsically motivated. It is anticipated that as the researcher seeks to achieve this objective, reasons why these teachers chose the teaching profession are likely to arise.

2.1.7 Beliefs about personal theories of teaching and learning

Teachers hold personal beliefs about teaching and learning. Whether or not they realize it, the decisions they make in the classroom are driven by these beliefs. These beliefs may relate to the purpose of education, the role of the school and what they believe is their role as a teacher and more. Beliefs about the role of education can impact teachers' epistemological beliefs, which include "beliefs about the nature of knowledge and the process of knowing" (Hofer & Pintrich, 1977, p117). Just as the epistemological beliefs are shaped by their beliefs about schooling, their beliefs about learning are shaped by their epistemological beliefs. Beliefs about learning relate to how learning takes place and what it means to be learned (Hofer & Pintrich, 1977). For example teachers who believe the self to be a valuable source of knowledge will more likely structure their lessons in ways that emphasize students to contribute to the learning process.

Olson and Bruner (1996) argue that educational practices are based on teachers' views or "folk psychologies" – their beliefs about children, learning and knowledge. They identified four general models of children and pedagogy typically held by teachers. The less sophisticated folk perspectives concentrate on children's behaviour, they view learning as imitation and conceptualize teaching as presenting information. On the other hand, the more sophisticated views conceive children as competent and intentional meaning learners and of education as a process of forming, identifying, questioning, weighing and

producing ideas based on evidence subject to scrutiny. Olson and Bruner (1996) propose that teachers be conceptualized as developing people, an idea that has often been overlooked. Adults often embrace either an incremental or entity concept of intelligence or ability. An incremental concept implies that intelligence is a malleable quality that can be developed through effort. In contrast the entity concept suggests that intelligence is a fixed, internal characteristics of a person; this concept is associated with the belief that characteristics are innate (Levy & Dweck, 1996, reported in Dweck, 1999). Studies have shown that an incremental view of intelligence is more adaptive than a fixed view because it fosters persistence in the face of challenge (e.g. Dweck, 1999).

Empirical research

A longitudinal study was conducted as part of the Early Childhood Project in Baltimore, USA. . The project was designed to examine the various ways in which early literacy different development occurred in children growing up in different sociocultural neighbourhoods. The study collected data on the children's home contexts as well as their teachers. In this paper, reference is made to the data collected from the teachers. The main aim of the teacher interviews was to explore their perspectives on the needs and aptitudes of their learners, their teaching practices and educational goals as teachers and the connection between the children's families and the school agenda. The data was collected from a sample of 44 female teachers: 26 first grade and 18 second grade teachers. Nineteen were of African American origin and 25 of European American origin. One on one interviews using a semi-structured format were recorded, transcribed and analysed using content analysis.

Results revealed four major themes that were addressed by the teachers. These are universal educability, child-centred education, individualized differential teachings and value of instruction. The distribution of these themes differed across the different ethnic groups. While the African American teachers showed a preference for the theme of universal educability (70%) the European America teachers prioritized the theme of teacher responsibility and the theme of individualized-differential teaching and to a lesser degree. Classification of secondary themes showed that African American teachers were more inclined to the theme of responsibility of teachers while the European American teachers preferred the theme of child centred education. Generally the African American teachers based their philosophy of teaching on the themes of universal educability and teacher responsibility. Teaching based on the themes of teacher responsibility and child centred education and individualized teaching were preferred options by European American teachers.

With regard to their conception of child development, the two groups agreed that all 3 domains presented (academic skills, social skills and self-esteem) were important for enhancing the development of children. These results were statistically non-significant between the African American and European groups. On the theme of "literacy is an important ingredient for

everyday life", results showed a statistically significant difference between the two groups (Chi-square 30.86, p=.0001). This theme was more popular with European American teachers. Another profound difference was noted for the theme "literacy as a skill to be learned". This theme was more popular with the African American teachers. African Americans from low income families emphasized the theme of literacy as a set of skills in comparison to middle income families who viewed literacy as a source of entertainment.

The above study highlighted the difference in beliefs between African American and European American teachers. The researchers attributed the differences to the following factors; differences in ethnic backgrounds and the socio-economic situations of the communities from where these teachers come from and differences in the pedagogical philosophies of the teacher training institutions attended by the teachers. To some extent it is these differences that inform the different personal perspectives and approaches towards their teaching of literacy. While the paper has tried to reveal the personal beliefs or ethno theories of the teachers in the study, it does not indicate the possible impact of these beliefs on teaching and subsequent performance of their learners. The direct or indirect effect of the different teacher characteristics and ethnotheories has not been studied. The current study will attempt to make this connection.

2.2 GraphoGame

This is a game-like training tool for supporting the acquisition of the basic reading skills. GraphoGame has been developed and used in various parts of the world in different language versions for learners who are learning to read. Research studies with GraphoGame have been conducted in various parts of Europe including Finland where it was initially developed. Countries such as Switzerland, the Netherlands, Britain, Sweden and Ireland have used it in various research with learners. In Africa, countries like Kenya, Tanzania, Namibia and Zambia are conducting research with learners and GraphoGame. In these countries, the game has been developed and translated in the local languages. For example, ciNyanja in Zambia, Kiswahili in Kenya and Tanzania and Afrikaans in Namibia.

GraphoGame was developed as a remedial tool during the Jyväskylä Longitudinal study of Dyslexia (JLD) conducted in Finland. The aim of the study was to identify the developmental courses of children at risk of developing dyslexia. This study revealed that the risk factors can be identified with certainty before school age. Based on these findings the question of how best to help these children, who otherwise would develop reading difficulties was asked. It was decided that Information Communication Technology (ICT) would be used to improve the literacy skills of dyslexic children (Lyytinen, Aro, Holopainen, Leiwo, Lyytinen & Tolvanen, 2006). It has been shown in Finland and elsewhere that independent of the factors that make it difficult for learners

to learn to read, the phonics method applied in GraphoGame is an efficient way to provide the preventive help.

A number of studies have established that GraphoGame could be used as an effective remedial tool to improve the reading skills of children with learning difficulties. It can be used to impart basic literacy skills as well as improve fluency i.e. automatized to leave mental resources for comprehending the written material. An intervention study conducted by Hintikka, Aro and Lyytinen (2005) with first grade non-readers revealed that playing the game was also helpful for children with attention difficulties, which occur with dyslexia. Results of research conducted with GraphoGame in Zambia showed that the effect of the game can be attained when both teachers and learners are exposed it (Jere-Folotiya et al 2014). The analysis for this study was conducted using one way ANCOVA with the learners' pre-test scores as a covariate. The study concluded that GraphoGame could be used as a literacy tool to complement the existing literacy curriculum. It also concluded that the greatest effect of the game on the literacy levels of learners is obtained when both teachers and learners are exposed to the game. However, the study did not identify which specific teacher variables contributed to literacy acquisition.

Other studies conducted in Zambia that were reported by Ojanen, Koala, Richardson and Lyytinen (2013) on several pilot intervention pilot studies that were planned to determine the potential use of GraphoGame to enhance reading ability in a multilingual society. The results of these studies revealed that one of the difficulties Zambian children face due to the multilingual environment is the confusion that results from reciting English letter names /ei/. /bii/. Learning letter names in English compromises the learning of letter sounds in the local languages. The study revealed that learners experienced difficulties learning letter sounds in the local languages after learning to recite the English letter names. For example, that the letters A and E are not /ei/, /ii/. Only after several repetitions of the correct sounds in ciNyanja through GraphoGame is the correct sound learnt. These pilot studies were conducted with learners only. Teachers were not included. As teachers may be a source of possible source of incorrect sounds in the local language, it is very important to take their contribution into consideration.

Bach, Richardson, Brandeis, Martin and Brem. (2013) conducted a longitudinal study with GraphoGame with German speaking kinder garden children. The aim of the study was to determine if electrophysiological and functional magnetic resonance imagery (fMRI) data significantly improved prediction of future reading skills. In this study GraphoGame was used to train German speaking kindergarten children grapheme-phoneme correspondences. After less than 4 hours of exposure to GraphoGame an increase in grapheme-correspondence of the children was observed not only in the behavioural assessments but also in the brain recordings which showed the activation of the Visual Word Form Area known to reflect letter recognition. In another study conducted by Pennala, Richardson, Lyytinen and Martin (2013) GraphoGame was administered to 7-year old Russian second language learners of Finnish.

The study aimed to investigate the contribution of GraphoGame in helping the children identify word and pseudo-word final phonemic length. Results from this study revealed that the game had helped children identify these words. This knowledge was then generalized to learn pseudo-words.

Another study was conducted to investigate if GraphoGame can enhance letter knowledge, reading accuracy, fluency and spelling of at risk children (Saine, Lerkkanen, Ahonen, Tolvanen & Lyytinen, 2011). Children were followed from the start of school to grade 3. The sample in this study consisted of 7 year old Finnish learners beginning school (N=166; 88 boys and 78 girls). These learners were randomly assigned to different groups: regular remedial reading intervention; computer based reading intervention and mainstream reading instruction. A parent questionnaire was administered to the parents in order to assess the background of the learners such as education level of parents, marital status, family size, child's birth order ad information about family risk about reading disability. Pre-reading skills of learners was assessed during the first 2 weeks of grade first grade. The screening process included letter knowledge, spelling and rapid naming exercises. Learners' IQ was estimated using the vocabulary, similarities, digit span and block design tests of the WISC-III.

Learners in the lowest 30% in the screening assessments were offered remedial reading instruction. GraphoGame intervention consisted of four weekly sessions lasting 45 minutes, conducted over a period of 28 days in groups of 5 were incorporated into the literacy curriculum of the learners in the intervention group. The intervention began 6 weeks after learners had started school. The average time spent on GraphoGame was 66 hours. The intervention time varied according to absenteeism and extra-curriculum activities the learner was involved in. Both experimental and control groups were trained by the same reading specialist in order to control for trainer effects. Results from the study revealed that children at risk of dyslexia benefited more from GraphoGame than the children in the other groups. The study concluded that children at risk of dyslexia can benefit from computer based letter name and letter sound training to acquire adequate decoding and spelling skills to attain the same levels as their peers who are not at risk.

As can be observed from the samples chosen and summarized in the research studies mentioned above, very little focus has been given to teachers and how GraphoGame, together with their beliefs and characteristics influence the literacy acquisition of learners. A component of this study sought to establish if this relationship between teacher variables and GraphoGame actually exists and if so, how it influences literacy acquisition of learners.

2.3 Teacher characteristics and student achievement

The characteristics of teachers are generally the area of focus when trying to establish whether a particular teacher is effective. The alarming trend in most

African countries regarding the low levels of learner achievement, whether in reading or mathematics, has necessitated various research to establish possible contributors to this problem. Although there is little existing research that directly correlates students' achievement outcomes with teachers' training, qualifications or conditions of service, the fact that the teachers are the main staff responsible for supporting learning makes a connection between these two factors highly likely. In educational research the assessment of effective teaching is generally based on the students' learning achievement (Berliner, 2005). Alexander (2000) explains that the need to assess teachers on the basis of learner performance standards is necessitated by difficulty of assessing teachers' normative attributes such as logical, psychological and ethical attributes, which tend to differ from culture to culture. The increased demand for accountability related to performance standards and the growing demand for evidence-based policy making further necessitates this form of teacher assessment (Braun, 2005; Sanders & River, 1996).

In support of this method of teacher effectiveness, Cochran-Smith (2001) notes that the "outcome" question is what motivates teacher education research and policy making. She further explains that there are three major ways in which teacher education are constructed: the long term outcomes, teacher test scores and professional performance. The long term outcomes are the major focus of the present study.

Cochran-Smith (2001) explains long term outcomes as the relationship between teacher qualifications (level of degrees, years of experience, preparation in subject matter and in pedagogy, certification, and on-going professional development) and student learning (student gain scores on achievement tests). This relationship is taken to be the percentage of variance in student scores accounted for by teacher qualifications when other variables are held constant. Teaching institutions tend to focus on teacher qualifications that are considered to be related to desirable learning outcomes. This sometimes calls for teachers to upgrade their qualifications and receive additional professional development. The link between these various teacher characteristics has been established by various researches. In certain instances, research findings are not conclusive. In Zambia, teacher qualifications have become of great interest to the Government as it emphasizes the need for teachers, especially those teaching secondary school, to upgrade their qualifications. Apart from teacher qualifications, the present study focuses on teacher characteristics such as age, teaching experience, PRP training and mother tongue, as well as more complex characteristics such as beliefs, motivation, etc.

Empirical research

Research findings about the relationship between teacher qualifications and learner achievement are inconclusive. Some studies show the positive effects of advanced degrees (Betts, Zac & Rice, 2003; Wayne & Youngs, 2003). Others argue that the need for an additional qualification raises the cost of teacher

education and the time it involves may prevent quality candidates from choosing the teaching profession (Murnane, 1996). Teacher education in a particular subject matter, as in the case of PRP training, which specifically focuses on literacy teaching, is also important. Research studies have produced contradictory findings regarding this. Some studies show that a positive relationship exists between teachers' preparation in the subject matter they teach and student achievement (Darling-Hammond, 2000; Goldhaber & Brewer, 2000). Findings by Monk and Kind (1994) suggested both positive and negative effects of teachers' in-field preparation on student achievement. Other researchers found a relationship in one subject area but not the other (Goldhaber & Brewer, 2000).

Research findings about the relationship between years of experience and learner achievement have revealed that a positive relationship exists between teacher effectiveness and their years of experience. However, this relationship is not always significant (Murnane & Philips, 1981). Available evidence suggests that while inexperienced teachers are less effective than more experienced ones, the benefits of experience appear to level off after a few years (Rivkin, Hanushek & Kain, 2000). Zuzovsky (2003) conducted a study to examine the relationship between teacher characteristics and student achievement in Israel. The study comprised 371 mathematics teaches and 317 science teachers who taught 4000 learners in 149 sampled classes. Teacher data was collected through the administration of teacher and school questionnaire. The dependent variables consisted of learners' estimates scores in mathematics and science. Data was analysed using multilevel regression analysis. The study revealed that teacher variables such as qualifications, years of experience, and training in subject-matter produced statistically non-significant effects on student achievement. Two variables, advanced degree and majoring in the field of teaching, had opposite effects in the two subjects. These variables were found to be positively associated in science, even though the results were not significant. In mathematics a negative significant effect was found. The study concluded that policy makers should be cautious about emphasizing an increase in teachers' formal education, certification and majoring in subject matter as these are not necessarily indicators of quality.

2.4 What do teachers need to know about their learners?

William James (1899/2001) believed that the fundamental conceptions of Psychology are important to the teacher. It could help teachers understand 'mental machine" and developmental processes of their pupils. John Dewy, who was James' contemporary, provided one of the foundations for constructivism. He believed that teachers must balance an understanding of the habits, traits and dispositions of individual children with the means of arousing their curiosity. He argued that it was important for teachers to be able to initiate, recognize, maintain and assess children's inner engagement in subject

matter and how the child's past and present experience can be related to subject matter so as to correctly direct children's growth.

The social constructivist Vygotsky believed that child development and education were intricately bound. He emphasizes the zone of proximal development and the role of the teacher in identifying and guiding its development. Likewise, Piaget believed that teachers need to understand child development especially if they wish to foster higher order reasoning and create autonomous learners who function successfully in a rapidly changing world. He believed that teachers need to design learning environments that foster inventive, creative, critical thinkers. To do this, teachers need to be mindful of the fact that children's and adults' thinking differ qualitatively. Furthermore knowledge is constructed by engaging actively with the social and the physical world, abstract thinking is built on concrete experience and that conceptual changes takes place through assimilation and accommodation. Kamii (1973) summaries Piaget's stance by stating that "the task of a teacher is to figure out what the learner already knows and how he reasons in order to ask the right question at the right time so that the learner can build his own knowledge" (p. 203).

Bronfrenbrenner (1979) emphasized the importance of the settings and circumstances in which students live for understanding children's behaviour and establishing productive programs and policies to promote the development of children and youth. Decisions made by teachers should be informed by an understanding of the context in which children live. These decisions include curricular and instructional decisions about materials and methods used in the classroom. Bronfrenbrenner (1986) included contextual factors such as how to communicate with children's families. Themes further developed by Heath (1983) and Moll and Greenberg (1988) include teachers' guidance of children's classroom learning, which can be fostered by understanding how the knowledge, practices and language socialization patterns within children's families and communities contribute to children's ability to function in the classroom as well as how to promote children's participation and positive social relations in the classroom (Juvanon & Wentzel, 1996).

Research indicates that children internalize views of themselves based on educational practices. Oslon and Bruner (1996) explain that "…each form of pedagogy implies a conception of learners that may in time be adopted by them as the appropriate way of thinking about themselves, their learning, indeed, their ability to learn. The choice of pedagogy inevitably communicates a conception of the learner. For example, children in problem-oriented (constructivist) classrooms report that understanding and collaboration promote mathematics learning. Children in traditionally taught mathematics classes report that conforming to the ideas of others and working quietly promotes learning (Wood, Cobb & Yackel, 1992). A recent study further indicates that children's' motivation and attitudes towards school are related to contemporary and traditional perspectives on learning expressed by children (Daniels, Kalkman & McCombs, 2001).

Together these studies suggest that educational practices children experience shape their developing self-perceptions as learners and potentially their "habits of mind" or customary way of engaging the world (Keating, 1996). Therefore the constructivist approach is supported in that it promotes valued child qualities (motivation, creativity, problem solving). The social constructivist view based on Vygotsky's theory of the developing mind in society offers an alternative, albeit overlapping framework for understanding children's thinking and learning. Many contemporary theorists believe that it is this view of the child that will provide teachers with the necessary tools for fostering children's learning and development (e.g. Anderson et al., 1995; Rogoff, Matusov & White, 1996; Tharp & Gallimore, 1988).

2.5 Research with Zambian first grade teachers

The following section will review studies conducted on Zambian teachers. A thorough literature review, in search of studies conducted with first grade Zambian teachers found no studies that focused specifically on first grade teachers and their learners. It was noted that firstly, most behavioural research that has been conducted in Zambian schools has focused on learning outcomes of learners from grade 3 onwards. Secondly, research on teachers focused on teachers in upper primary or secondary. This section will present available research conducted with Zambian teachers in general, as it relates to the focus of this study. Previous research reports obtained from the University of Zambia library revealed that recent studies relevant to this research focused mainly on the role of the local language in learning, motivation and teaching approaches (Matafawali, 2010; Mubanga, 2012; Mwanza, 2011; Kumwenda, 2010; Chibamba, 2012). The subsequent paragraphs will discuss some of these studies.

2.5.1 Teacher characteristics

The Southern and Eastern Africa Consortium for Monitoring Education Quality (SACMEQ), 2011 report provides findings of research conducted on the characteristics of grade 6 teachers (age, gender, qualifications, teaching experience) and their performance in a standardized reading test. The research was conducted in 15 African countries, namely Zambia, Zimbabwe, South Africa, Malawi, Mozambique, Botswana, Swaziland, Lesotho, Namibia, Kenya, Uganda, Mauritius, Seychelles, Zanzibar (mainland) and Tanzania. The purpose of the study was to determine the quality of the teaching force across all the SACMEQ countries and their subject matter knowledge.

The study revealed that the average age of grade 6 teachers across the SACMEQ countries was around 37 years. The average age of grade 6 teachers in Zambia was around 32. Zambian teachers were more than ten years younger (average age 31.8) compared to teachers in Mauritius, which had the oldest

teachers. Results also showed that 55% of SACMEQ pupils as a whole were being taught by female teachers. Previous results have shown that when learners (both boys and girls) are taught by females they perform better than when they are taught by male teachers. However, variations existed across SACMEQ schools. In Seychelles 96% of grade 6 pupils were being taught by female teachers; 26% in Malawi; 27% in Uganda; 29.5% in Zimbabwe and 53% in Zambia.

Results on teacher education and training, revealed that for SACMEQ as a whole, 9% of grade 6 learners were being taught by reading teachers whose highest level of general education was secondary school. In Zambia and South Africa 22-25% of the learners were being taught by teachers who had primary education only. Primary education alone is deemed inadequate. The report argues that teachers with low qualifications may not have adequate content knowledge to teach effectively. 100% of the teachers in Seychelles had attained secondary level education or above. Zanzibar, Uganda, Tanzania (Mainland), Zimbabwe, Kenya, Mauritius, and Swaziland had between 88% and 99% of teachers who had attained senior secondary education. In Zambia 22% of the learners were in schools where they were being taught by teachers with primary school education only, when secondary education is deemed the minimum desirable level of academic training of a primary school teacher. For other countries in the region the minimum number of years that reading teachers had taken to complete their professional training was 3.3 years, for Zambian teachers the mean was 2 years.

The average years of teaching experience for Zambian teachers was 6 years, a stark difference from the highest in the region which was 21 years. With regard to achievement scores, generally all teachers from the region were more knowledgeable than their pupils for both SACMEQ II and SACMEQ III although large variations existed between the different school systems. The mean score for Zambia was 758 in comparison to Seychelles which was the highest (831) and the lowest Zanzibar (673). Trends in achievement show that for SACMEQ as a whole there was an increase from 734 points in 2000 to 750 points in 2007. However, scores for Zambia remained the same with a negligible decline (-2 points). The mean scores for teachers were compared to that of the learners. The average score for the learners was 500. These results revealed that on average the teachers had greater content knowledge than the learners.

This report provides very useful information that gives some insight into the characteristics of grade 6 Zambian teachers. However, it focuses only on grade six teachers at the exclusion of teachers in earlier grades. In addition, the research did not consider the possible relationship between the characteristics that were identified and learning achievement. The present research will address some of the concerns indicated in this paragraph. An attempt will be made to determine the effect of teacher characteristics on the performance of the learners.

2.5.2 The NBTL

Mambo, 2010 conducted a study that had three main objectives (1) to establish the challenges that teachers experience when implementing the NBTL course in teaching reading to first grade learners with hearing impairments (2) to find out if learners with hearing impairment break through to literacy in Grade one (3) to find out the teachers' views on the suitability of the NBTL course methodology for teaching reading to Grade one learners with hearing impairment. Both qualitative and quantitative research methods were used in this study. The sample, which consisted of 15 special education teachers, was purposively selected from schools and units for the hearing impaired. The data was collected from teachers using questionnaires. The major findings of the research were that learners with hearing impairment failed to break through to literacy in Grade one. Teachers in the study attributed this to the slow pace at which hearing impaired learners learn and their failure to cope with the academic work proposed in NBTL. In addition, learners used local signs to communicate, which some of the teachers could not understand.

The study established that teachers in the study had difficulties teaching the hearing impaired using the NBTL. More than three quarters of the teachers admitted having difficulties implementing the NBTL with learning with hearing impairments. Only one teacher indicated being effective in the use the NBTL with hearing impaired learners. Eighty seven percent (87%) of the teachers disapproved the continued use of the methodology. Some of the challenges cited by the teachers include a lack of understanding of the local signs; challenges completing all the stages of the NBTL lesson plan (no teaching of phonemes due to hearing impairment of learners); lack of adequate teaching and learning materials and lack of in-service training on the use of the NBTL. Mambo (2010) noted that teachers were concerned with the lack of consultation by curriculum developers from them (teachers) the implementers of the curriculum. He concluded that the NBTL is not suitable for use with learners who have hearing impairments, even if the methodology may be suitable for normal children. This study is similar to the current study in that the challenges teachers experience implementing the NBTL are being studied. One major difference with the current study is the sample used in the study and the statistical procedures used to analyse the data. Nonetheless, the research provides information about teachers' experiences of using NBTL with hearing impaired learners.

2.5.3 Teaching approaches

Musonda (2009) conducted a study to review and investigate the implementation of the learner centred teaching (LCT) in the teaching of Mathematics at Nkurumah Teachers College (NTC) and Copperbelt Secondary Teachers College (COSETCO). The study was qualitative in nature. Data collection instruments included observation schedules and questionnaires (structured and unstructured). These were administered to a purposively

selected sample of 8 mathematics lecturers, 5 from COSETCO and 3 from NTC. The sample was chosen from a population of mathematics teachers from both colleges. The student sample N=251 was selected using proportionate sampling of students from colleges, 63.7% from COSETCO and 36.3% from NTC. The age of students was 18-43 years, 72% of whom were female. Data analyses were conducted using SPSS to calculate percentages and frequencies. Qualitative data was first transcribed then analysed by identifying key concepts that related to LCT.

Results of this study revealed that both lecturers and students in these colleges were in agreement that the LCT approach was being implemented in the classrooms. This was evident by the kinds of activities that were conducted with students in the classroom and the LCT centred methodologies that were being used to teach in the classrooms. The study established that performance in Mathematics can be affected either positively or negatively by the method of teaching used. The major recommendation made was that educators receive training and guidelines on how to successfully use the LCT approach in the classroom.

In comparison to the current study, the sample in the above mentioned study consisted of older learners and lecturers in teacher training institutions. Musonda's (2009) study is similar to the current study in that they both refer to the LCT. The study is relevant to the current study because the findings of the research provide some insight into the use of these teaching methods. However, the above study focuses only on Mathematics, unlike the current study which focuses on literacy. In addition, the research methods and data analysis used were limited only to percentages and frequencies. This may be seen as a limitation because no association or cause-effect relationships could be established in the study. Inferential statistics were not used to determine if the identified use of the LCT had impact on learning of mathematics. In the current study, self-reports were also used although these were supported by data collected during the focus group discussion. The attitudes of teachers towards the two major teaching approaches were then used to calculate how these attitudes impacted the learning outcomes of first graders. Unlike the study by Musonda (2009) the present study collected performance data of the learners.

2.5.4 Teacher motivation

Mutono (2010) conducted a survey to determine the factors that affect teacher motivation in Zambia. This study was conducted using both qualitative and quantitative methods of data collection. The researcher explored the teachers' own views and perspectives about what they thought affected their motivation. The sample comprised 82 teachers. Interviews, questionnaires and focus group discussions were used to elicit responses from the teachers and other education stakeholders. Qualitative data analysis was conducted using thematic analysis. Quantitative data analysis was conducted using SPSS to produce frequencies. Results revealed that teachers were not motivated. Their conditions of service, particularly remuneration; lack of accommodation and promotion

opportunities; inadequate teaching and learning materials were cited as reasons for this demotivation.

The above study is significant because the results highlight some of the challenges experienced by Zambia teachers. The current study also attempts to highlight the challenges experienced by Zambian teachers, specifically first grade teachers. While the study by Mutono (2010) provides some insight into these challenges, it does not prove statistically how the demotivation affects the performance of the learners. Furthermore, the type of motivation that has been identified is mainly extrinsic motivation. Nothing has been mentioned about intrinsic motivation. No attention has been given to the learners, who ultimately feel the effect of teachers' motivational levels. The current study has incorporated the limitations cited above to give a more comprehensive view of motivation and how it relates to the literacy acquisition of the learners.

Mwanza (2010) conducted a similar study that sought to investigate factors that affect motivation of teachers in Mufulira district. The main objective of the study was to determine the extent of teachers' motivation, reasons for and effects of poor motivation. The survey study used questionnaires and interviews. The sample consisted of 172 randomly and purposively sampled respondents, 141 teachers, 10 head teachers, 10 PTA chairpersons, 9 former teachers and two Education Standards Officers (ESO). Qualitative data analysis was conducted using thematic analysis. Quantitative data analysis used SPSS. Results from this study were similar to those of Mutono's (2009) study. In both studies, results revealed that the extent of demotivation was large. It resulted in increased absenteeism, misconduct, transmission of negative ideas about the teaching profession and indulgence in secondary employment. The teachers cited inadequate salaries, lack of opportunity for promotion and low prestige in basic school teaching, as major reasons for being demotivated. The study concluded that a considerable number of basic school teachers do not apply themselves fully when teaching because they have low job satisfaction and are poorly motivated. Therefore, learners in schools are not being taught properly. The study further concludes that this may have an effect on the attainment of the Millennium Development Goal number two (MDG). Recommendations made include improving the conditions of service of teachers. This study is important to the current study because it focuses on the challenges that are experienced by teachers. However, the study did not establish how the identified motivation affects the performance of learners.

A study on teacher motivation was also conducted by the Voluntary Service Overseas (VSO, 2002). This is a registered charity, which places volunteer teachers and other education professionals in various disadvantaged schools to work with local teachers. VSO conducted a study of teacher motivation in three third world countries; Malawi, Zambia and Papua New Guinea (PNU). The criteria used to choose these countries included: VSO's experience of education delivery in that country; willingness of VSO programme staff in that country to engage in the policy dialogue at national level of teacher issues and lastly teacher motivation, considered by both

volunteers and staff of VSO considered to affect the quality of education. The research explored the perspectives of teachers on what they thought were critical factors influencing their motivation. The research also sought to identify the changes required in both national and international policy, practice and process in order to enhance the motivation of teachers. The sample consisted of secondary school teachers from rural disadvantaged schools, with a range of education qualifications, many of whom were trained to teach primary school, VSO volunteers and VSO volunteer reports.

Topics of school and teacher effectiveness, morale, motivation and job satisfaction, teacher training and school management were conducted using desk-based research. Additional data was collected using focus group discussions and in-depth interviews. The study was conducted with VSO volunteers, teachers and school managers. Educational stakeholder such as NGOs, teacher unions, church missions and coalitions were consulted through semi-structured interviews and workshops. Results from this study revealed that teacher motivation in the three countries was fragile and declining. This is due to neglect of the secondary sector, lack of teaching resources and low self-esteem because teachers felt they were not respected by others. This had created frustration of teachers across the three countries. In the case of Zambia, despondency escalated (p. 18). The research also found that the teaching performance of teachers was strongly influenced by their motivation. The motivation factor is often ignored in education management and policy formulation.

The findings of the VSO study also highlight the link that existed between teachers' motivation, performance and education quality. In all three countries issues that related to their sense of wellbeing and support to operate successfully as professionals were ranked highly. It was ranked more highly than remuneration issues in affecting their motivation, especially in Malawi. In PNG poor school management was cited as a major source of teacher demotivation. In Zambia issues related to inadequate salaries and poor school management were ranked highly by the teachers. Accommodation was also an issue of concern for teachers from the three countries. Teachers reported living in dilapidated building with leaking roofs, broken windows, poor sanitation, lack of electricity and running water.

In Zambia, VSO volunteers completed a questionnaire on the importance of teacher motivation. They reported that teacher motivation or morale was integral to the quality of education in the schools they worked in. They noted that the lack of motivation on the part of Zambian teachers constrained their effectiveness. This was observed by high teacher turnover and absenteeism. Teachers left to look for greener pastures either within or outside the teaching profession, sometimes even outside the country. This had led to a shortage of teachers. In Zambia and Malawi, absenteeism of teachers had become commonplace as teachers took on second jobs to supplement their meagre income. In Zambia particularly, "remote teaching" was prevalent. This refers to the practice of writing notes on the board or using learners to read out notes

from a textbook to the class, while the teacher occupied themselves elsewhere. In Malawi, demotivated teachers depended on "chalk and talk" methods or reading from textbooks as teaching methods (p. 25). VSO volunteers cited Governments' failure to tackle these problems as even more frustrating for them.

The report recommends that Governments seriously address factors affecting teacher motivation by establishing teaching councils, which will serve the purpose of facilitating debates and discussions of teachers' needs and contributions outside the domain of industrial relations and terms and conditions. Reform processes should ensure participation of teachers, NGOs and other civil society working in education related fields. The decentralization process should be accompanied by effective systems that will ensure bottom-up communication with schools. Monitoring and evaluation should be conducted frequently. The final recommendation is that donors should be willing to supplement teachers' salaries the same way they do other interventions. They should also ensure regular teacher representation in their decision making processes. Mechanisms should be put in place to ensure that they receive direct feedback from teachers on the efficacy of education reform (p. 2).

Recommendations for NGO's are that they support the inclusion of teachers' voices in education decision making, even in the NGO's own decision making processes. Various NGOs should work together to ensure proper training and identification of teachers who can participate in open decision making. The value of teachers must be demonstrated so that societies develop a more positive and supportive attitude towards teachers.

The above study contributes to the current study in that it focuses on teacher motivation. It provides important findings on the importance of teacher extrinsic, and to some extent, intrinsic motivation. However, the study does not clearly state the grades that the teachers in the study were teaching. In addition no learner data is presented. This makes it impossible for the researchers to prove that a link actually exists between motivation levels of teachers and their inability to teach diligently (which would be reflected in the learning outcomes of the learners). The current study makes a distinction between extrinsic and intrinsic motivation. It also includes learner data which will be used to established the effect of motivation (be it extrinsic or intrinsic) in the acquisition of literacy.

2.6 Reading achievement of Zambian learners

Various studies on pupil achievement and levels of reading and mathematics have been conducted by SACMEQ. The SACMEQ report (Hungi et al 2010) provides information on the levels and trends in reading and mathematics achievement for 15 SACMEQ countries for SACMEQ projects II (2000) and III (2007). The generation of scores for reading and mathematics was conducted using a linear transformation of the scores, which results in the average/mean

scores and standard deviation being 500 and 100 respectively. Eight levels of competence for each test were identified. The first three levels reflected the mechanical nature of the most elementary competencies. The remaining five levels reflected the deeper level understanding of competencies that were specific to the subjects. The eight levels of competencies were designed to provide information on "what pupils and teachers can actually do, and also suggest instructional strategies relevant to pupils who are learning at each level of competence" (p. 5).

The first level focused on pre-reading skills. These skills include matching words and pictures involving everyday concrete concepts. Level two focused on emergent reading skills. Skills assessed include matching words and pictures that include prepositions and abstract concepts and using cues to interpret phrases by either sounding out or using simple sentence structures. Interpreting meaning in simple texts by reading or reading back was the focus of the third level. Level four skills involved reading for meaning, which involved reading on or back in order to link and interpret information located in various parts of the text. Interpretative reading was the fifth level. This level involved reading on or back in order to combine and interpret information from various parts of the text in relation to external information that completes and conceptualizes information. Level six related to inferential reading which involved reading through long texts with the view to combining information from various parts of the texts in order to determine the writers' purpose. Level seven involved skills related to analytical reading. This involved reading through long texts in order to connect the information in the text with the view of inferring the writers' personal beliefs. The last level assessed critical reading. This involved reading and combining information from texts with the view to inferring and evaluating the writers' assumptions about the topic as well as characteristics of the reader.

This report, like the other SACMEQ reports shows that Zambian pupils at grade 6 levels perform poorly in Mathematics and Reading, in comparison to other countries in the region. Focus once again, has been on the pupils, at the exclusion of the teachers. The various challenges experienced by teachers in the teaching and learning process could help explain the poor performance of the learners.

The above study is important because it highlights the problem of low literacy acquisition amongst Zambian learners in relation to other countries in the region. It compares the performance of Zambian learners with learners from countries in the region. Performance over the years shows that the performance of Zambian learners in Mathematics and Reading has been consistently low, with negligible improvement. These findings further strength the focus of the present study, which is to establish the role of teachers within the context of low literacy acquisition levels of the learners. However, the study does not make mention of how teacher variables or factors could be contributing to this problem. This study will attempt to establish this link.

Pintrich (1990) suggested that teacher beliefs would be one of the most important psychological constructs in teacher education. Kegan (1992) proposed that teacher beliefs play a role in the teaching process and serve as an indicator for decisions that teachers make in the classroom (Rokeach, 1968). Building on these theoretical perspectives about beliefs, the current study hypothesized that since teacher beliefs are likely to influence decisions teachers make in the process of teaching, then their beliefs about the literacy curriculum, motivation, teaching approaches and personal theories of teaching would influence the literacy outcomes of first grade learners. The empirical literature in this study tried showed the importance of teacher characteristics as evidenced by various studies conducted (Betts, Zau & Rice, 2003; Wayne & Youngs, 2003; Goldhaber & Brewer, 2000). The connection between teacher characteristics and literacy acquisition is yet to be studied within the Zambian context. Therefore the current study was testing the hypothesis that characteristics of first grade teachers would impact the literacy acquisition of first grade learners. The overall hypotheses is that teacher variables, whether beliefs or characteristics could be contributing to the low literacy levels of Zambian learners. In relation to GraphoGame, the current study hypothesized that GraphoGame would interact with teacher variables to impact literacy.

3 AIMS OF THE STUDY

The major aim of the study was to first identify general characteristics of Zambian first grade teachers including their beliefs about the NBTL, teacher and learner centred approaches, intrinsic and extrinsic motivation and their personal theories of teaching. In order to understand if and how these different characteristics impact reading acquisition of learners, a more specific attempt was be made to link the identified characteristics and beliefs to the literacy acquisition of the learners. It was also conducted to determine if GraphoGame interacts with teacher variables to impact literacy outcomes.

3.1 Objectives

(a) To identify the general characteristics of first grade teachers and their beliefs about the literacy curriculum (NBTL), teaching approaches, personal theories of teaching and motivation.
(b) To determine how the above characteristics and beliefs impact the literacy acquisition of their learners.
(c) To determine if GraphoGame interacts with teacher variables to impact literacy acquisition.
(d) To explore the challenges experienced by first grade teachers.

3.2 Research questions

(a) Do Zambian first grade teachers believe they are intrinsically or extrinsically motivated? How does their belief about motivation impact literacy acquisition of their learners?
(b) What teaching approaches do first grade Zambian teachers believe they use, the teacher centred or the learner centred approaches? How does

belief in the identified approach impact the literacy acquisition of their learners?

(c) What beliefs about personal theories of teaching do Zambian first grade teachers have? What impact do these theories have on literacy acquisition of their learners?

(d) What beliefs do first grade teachers have about the NBTL? How do first grade Zambian teachers' attitudes towards the NBL impact literacy acquisition of the learners?

(e) Does GraphoGame interact with teacher variables to influence literacy acquisition of learners?

(f) What difficulties do first grade teachers experience in their day to day teaching of literacy?

4 METHODOLOGY

4.1 Research design

Methodological triangulation, which is the use of mixed methods in conducting research, was used in this study. A mixed method was chosen because it would provide more in-depth information about Zambian first grade teachers and their experiences. Yoshikawa, Weisner, Kalil and Way (2008) note that quantitative research methods can be used to understand prevalence of particular practices, behaviours, and beliefs. Qualitative methods on the other hand can be used to understand meanings, functions, goals and intentions. Yoshikawa et al. (2008) further note that the use of both qualitative and quantitative research methods can help give a more comprehensive view on the relationship or discrepancies that may exist in the data collected. In essence the combined use of these two methods can be used to valid the data collected.

Classroom based educational research employs qualitative and quantitative designs, or a combination of both. The difference between the two, as Best & Kahn (1998) describe, lies in numbers. Qualitative research involves watching and asking, and aims to describe events and persons in detail without the use of any numerical data. On the other hand, numerical data is of utmost importance in quantitative research which is concerned with measuring and controlling numerically analysable information. The strength of quantitative research lies in its ability to quantify generalizable variables and measure factors in terms of amount, intensity or frequency with the view of explaining, describing and making inferences from obtained results (Babbie, 1993; Denzin & Lincoln, 1994). In contrast, qualitative research attempts to achieve a deeper, holistic understanding of the phenomenon being studied. It seeks to discover underlying meanings and patterns of relationships.

The core study, from which the data in this study was collected, used the experimental design. The study had two major objectives: (1) To determine the effectiveness of GraphoGame, as a tool that could be used to increase literacy levels of first grade Zambian learners (2) To determine, which of several

intervention combinations with GraphoGame would be most effective in improving literacy levels. The study involved a control group and several intervention groups. The groups were labelled in the following ways:

Control group (C) – this comprised both learners and teachers that did not receive any intervention and were not exposed to it any way.

Teacher exposed to GraphoGame (TG) – This group consisted of teachers who were given a phone with GraphoGame on it. They received very minimal orientation on how to play the game.

Teacher intensively oriented to GraphoGame (TIG) – This group consisted of the 19 teachers who were extensively oriented on who to play GraphoGame and the principle benefits thereof. Their learners did not play the game.

Learner played GraphoGame (LG) – This group included learners who played the game but whose teachers were merely informed about the game. The teachers were not exposed to the game.

Students and teachers played GraphoGame (LG + TG) – in this group both teachers and learners played although teachers received minimal instructions about the game.

Students and teachers played GraphoGame (LG + TIG) – Both learners and teachers in this group played the game. Teachers received extensive orientation on how to play GraphoGame. They were also informed about the benefits of playing the game.

Baseline assessments were conducted for four cognitive tests before the administration of the game. After several play sessions, post-test assessments were conducted with the same measures. The GraphoGame intervention that was conducted will not be discussed in great detail as it is not the focus this paper. However, information about the core study, including its findings will be periodically referred to in the subsequent sections.

In the current study the exploratory research design was used. This research design was chosen in order to gain insights into the characteristics of first grade Zambian teachers and their beliefs. This was conducted to determine if and how these affect the literacy acquisition of their learners. The research design explores the beliefs and views of the teachers based on questionnaire responses and focus group discussions.

4.2 Target population and sample

Target population in this study consisted of all first grade learners and their teachers in Government schools, Lusaka Urban District

4.2.1 Core study sample

The core study, from which the sample in this study was derived consisted of 573 randomly sampled learners 52.4% females and age range 5-9 years and their teachers N=84. All the teachers were female. This sample was selected from 42

randomly sampled Government schools in Lusaka urban district. The total number of first grade classes randomly sampled was 84 (each representing one class). As the study design was experimental in nature, the sample sizes in the various intervention groups are represented in the table below.

TABLE 1 Gender distribution for the intervention groups and the control group

	Gender						
	C	LG	LG+TG	LG+TIG	TIG	TG	Total
Female	163	33	24	31	41	8	**300**
Male	151	30	23	38	26	5	**273**
Total	**314**	**63**	**47**	**69**	**67**	**13**	**573**

4.2.2 Current study sample

The sample in this sub-study comprised N = 63 first grade female teachers age range 25-54 years. The sample of learners consisted of N=288, age range 6-9 years and 52.2% females. In the core study, 84 classrooms were randomly sampled, making the total number of teachers 84. In this sub-study only 63 out of the 84 teachers were included because the other 21 teachers were not included for various reasons. Some teachers were transferred to other schools. Other schools were excluded from the sample due to data collection procedural errors. Their teachers were also excluded. Other teachers did not attend the teacher workshop that was held. It was during this workshop that teacher questionnaires were administered.

4.3 Sampling procedure

4.3.1 Core study

For the core study a total of 42 schools were randomly sampled from a list of basic schools obtained from the Ministry of Education. Each school was given a number, which was written on a piece of paper. The pieces of paper were then mixed together and each of the project leaders in the study took turns into selecting a piece of paper from the box without looking. From the schools that were selected, two first grade classes were then randomly sampled from the list of Grade one classes in the school. These randomly sampled classes were then randomly assigned to either an experimental or control group. Six learner (3 boys and 3 girls) were then randomly sampled from these classrooms using the class register.

4.3.2 Current study

The teachers in the current study are teachers from the randomly sampled classrooms in the core study. As the sample in the core study was selected randomly, the sample of teachers in the current study is also representative of first grade teachers in Lusaka Government schools. The teacher data was collected separately from the core study. The data was then matched with that of their learners, which was collected during the core study. For the purpose of this sub-study it was important that both learners and teachers come from the same class. This would enable the researcher establish the effect of teacher beliefs and characteristics on learner outcomes by linking the teacher data with the learners' scores on the cognitive tests.

4.4 Pilot study

4.4.1 Core study

Four schools were selected to conduct the pilot study with the four cognitive tests. The aim of the pilot was to determine the effectiveness of the proposed data collection process, the instruments including the amount of time it would take to test a specified number of learners. After the pilot, minor adjustments were made to the orthography test. The number of practice items was reduced because they prolonged the administration of the test. Learners were getting tired before attempting the final actual test items.

4.4.2 Current study

The measures used to index orthographic awareness and mastery of letter-sound correspondence rules were refined in the light of local pilot work, and found to have moderate-to-high test-retest reliability. This means that the reliability and validity of these tests as indices of teacher effectiveness are more reliable than would have been the case if imported tests with no locally collected psychometric credentials had been used. In addition a teacher questionnaire was piloted and interviews with the teachers were held in the same schools in which the pilot for the core study was conducted. Information from the teacher questionnaire that was piloted and the interviews were used to design the final teacher questionnaire. Focus group discussions (FGDs) were conducted after the teacher questionnaire was administered. Information from these discussions was used to corroborate the teachers' responses to the questionnaire.

4.5 Instruments

4.5.1 The core study

Several cognitive tests were administered during the core study. These included the orthography test, spelling test, Peabody Vocabulary Test (PVT) and Zambia Achievement test – Mathematics (ZAT-M). These tests were administered to individual learners. As the study was focused on the assessment of rudimentary literacy acquisition skills, two of the tests used in this study were designed to assess orthographic awareness and decoding skills of basic sounds, syllables and basic three and four letter words. Furthermore, these tests measured in much the same way, the letter sound correspondences that were being enhanced when the teacher played GraphoGame and imparted the knowledge to the learners. Measures of actual reading were not included in this study.

Orthography awareness test

This test was designed to measure emergent literacy skills of early grade learners. It was designed using the ideas developed, illustrated and implemented by Ojanen et al. (2013). The test was individually administered to learners. The task was to underline each item that represented a conventional alphabet letter, syllable or word. The learner was first exposed to several practice items. When the test administrator was satisfied that the learner had understood the instructions the actual test was then administered. The practice section included three main sections: the first section consisted of letters and non-letters visual symbols; the second section consisted of various ciNyanja syllables and the third section consisted of 3-4 letters, combined to form both ciNyanja words and nonsense words. The test consisted of 18 rows, each row containing 6 possible responses (3 genuine and 3 incorrect). One point was given for every correct response and deducted for every incorrect response. The range of possible scores was thus between 108 and -108. The practice phase was untimed and often lasted for 5 – 10 minutes. The time allocated for completion of the test was three minutes.

Spelling test

The spelling test was designed to measures early grade learners' competence in spelling and reading ciNyanja. The test has been used before with Zambian first graders (Ojanen et al, 2013). It consists of 20 items. Each item is represented by a row of four possible responses. The test administrator presented the stimulus orally in the form of either letter sounds or words. The learner then chose the correct response from four possible responses, according to the stimulus. The items were arranged in order of increasing difficulty. Five rows of phonemes were presented first, followed by 5 rows of syllables, 5 rows of three letter

words and lastly 5 rows of four letter words. In each of these rows, only one option out of the four options was correct. A score of 1 was given for every correct response and 0 for every incorrect response. The range of possible scores on this test was 0-20.

Vocabulary test

The vocabulary test used in this study is an adaptation of the Peabody Picture Vocabulary Test (PPVT) designed by Dunn & Dunn (1997). This test has been widely used in Zambia. It was adapted and translated into four indigenous languages, ciNyanja, iciBemba, siLozi and iciTonga by the Zambia Early Childhood Development Project (Fink, Matafwali, Moucheraud, & Zuilkowski, 2012). This project was a collaboration between the University of Zambia and Harvard University. This RESUZ project established reliability of the test to be α = .83. The test was used to assess learners' receptive language competence. A series of spoken words and pictures arranged in order of increasing difficulty were presented to the learner. The task of the learner was to choose a picture that corresponds with the spoken word from a set of four alternatives. One mark was given for a correct response and zero was given for an incorrect response. The range of scores for this test was between 0-30.

Mathematics

The Zambia Achievement Test – Mathematics (ZAT-M) was developed by researchers from University of Zambia and Yale University (Stemler et al., 2009). It assesses mathematics competency of primary school learners. Items in the scale are arranged in order of difficulty to cater for grades 1-7. This test has been standardized on a large population of primary school students in Zambia. During the UNZA/Yale project, the instrument reported an internal consistency among items of α = .77. Test-retest reliability using Spearman rank coefficient produced a significant correlation of ρ =.56 (Stemler et al., 2009). The test was individually administered to each learner. The administrator read out questions to the learner. The learner was then expected to choose the correct response to the question from four possible responses. A score of 1 was given for every correct response and 0 for incorrect responses. The range of possible scores on this test was 0-30. Learners were not allowed to calculate the answers using pencil and paper.

GraphoGame

GraphoGame is a child-friendly computer game that helps children in the process of learning to read (Lyytinen, Renames, Alanko, Poikkeus, Taamila, 2007; Lyytinen, 2008; Lyytinen, Erskine, Kujala, Ojanen & Richardson, 2009). It was first developed at the University of Jyvaskyla in Finland. The game was initially aimed at observing how the process of reading acquisition takes place (Lyytinen, 2009). In the core study, the game focused on improving letter-sound

correspondence rules. The content of the game was administered in the medium of instruction used in Lusaka district, ciNyanja. It consisted of recorded letter sounds, syllables and simple words. These recordings were conducted by a native Zambian speaker of ciNyanja. In this study, the game was administered to both learners and students according to the intervention groups. Headphones were used in order to ensure that the player could clearly hear the sounds.

4.5.2 The current study

For the purpose of this paper, only two of the above mentioned tests were used, the orthography and spelling test. These two tests were chosen because they were used to assess literacy levels of the learners at different points from second to third term. Baseline and post-test scores for these measures were obtained. In the current study, the findings on how teacher characteristics impact learner outcomes have greater construct validity because the measures used to assess learner outcomes were based on strong and coherent theoretical perspectives on how learners acquire literacy. The reason for linking the data in this way was to allow the researcher to conduct inferential analyses that would help establish a link between the teacher variables and the learning outcomes of their learners.

Teacher focus group discussions

FGDs were conducted with some of the teachers. A focus group is a small group of 6-10 people led through an open discussion by a skilled moderator. The group needs to be large enough to generate rich discussion but not so large that some participants are left out (Bryman, 2004). The main purpose of conducting FGDs in this study was to obtain an in-depth understanding of what it means to be a Zambian first grade teacher. It was hoped that the use of mixed method approach in this way would validate the findings in this study.

A focus group interview guide was used to conduct the discussions. This served as a roadmap, which was used for all the focus group discussions that were conducted. One of the major advantages of using FGDs is that participants have the advantage of learning from each other as they hear each other's experiences. Participants are able to make comments and insights beyond their original thoughts. General areas of discussion included, what influenced their decision to become teachers, the challenges they experience as first grade teachers, how they deal with these challenges, what they like most about being first grade teachers, their views about the literacy curriculum (NBTL) and the challenges they experience in its implementation, their suggestions on how it can be improved and their views on research findings showing the poor performance of Zambian learners in the area of literacy.

The focus group discussions were conducted with three different groups of teachers over a period of three days. Each group was exposed to the same procedure and set of questions. A group consisted of between 5-8 teachers. Each session lasted between 3-4 hours. A total of 24 teachers participated in the

FGDs. Letters of invitation were sent to the teachers 10 days before the assigned day. This was done to give the teachers enough time to seek permission from the head and also confirm or reject the invitation. Each teacher received an individual letter, which took into consideration the most convenient time the teacher could be available.

The FGDs were conducted at the University of Zambia in the Department of Psychology. Before the sessions began, the researcher welcomed the teachers and assured them of confidentiality and anonymity. They were encouraged to speak freely, while at the same time respecting the views and opinions of their fellow participants. The participants were informed what the goals of the FGDs were. Permission was granted from the teachers to record the sessions. The information collected during these focus group discussions was used to design the teacher questionnaire.

Teacher questionnaire

A questionnaire is a self - report instrument useful for economically and speedily obtaining data from a large number of respondents (Brown, 2001). In the study of teachers' beliefs and practices, questionnaires have made regular appearances (e.g. MacDonald, Badger, & White, 2001). In this study a semi-structured questionnaire was used to collect data on teacher characteristics and teacher beliefs in order to obtain both qualitative and quantitative data. It consisted of a demographics section, which collected information on the basic characteristics of the teacher. It also contained close-ended sections that required teachers to respond to statements on a five point Likert scale. This section of the questionnaire consisted of four dimensions, which included the New Breakthrough to Literacy (NBTL), teaching approaches, motivation and personal theories of teaching. The questionnaire also consisted of open-ended questions that invited teachers to describe or comment on an issue in detail. The questionnaire was designed to address three main objectives: firstly to find out the attitude of teachers towards the NBTL programme; secondly to identify the beliefs that teachers held with regard to teaching approaches, motivation and personal theories of learning and teaching and thirdly, to identify the various challenges that teachers experience as first grade teachers. This third objective was achieved through their responses to the open-ended questions.

The final content of the questionnaire was based on teachers' responses to the piloted questionnaire as well as information derived from the teacher FGDs. The pilot provided the researcher an opportunity to assess whether or not the teachers understood the questions. The actual wording of the questionnaire was decided upon by the researcher.

4.6 Reliability and validity of the instruments

Orthography test - This test was piloted before the actual study commenced. The test had a test-retest reliability of r = .50 (N=44).

Spelling test - This test was also piloted before the study commenced. The test-retest reliability was r= .82 (N=43).

Vocabulary test (PVT) – The test re-test reliability of this test was r = .40 (N=40).

Mathematics (ZAT-M) - The test-retest reliability for a small subsample in this study was found to be r = .80 (N=12).

Teacher questionnaire - This questionnaire was designed using Likert scales. It consisted of four sub-scales. The scales assessed beliefs about the NBTL, teaching approaches, motivation and personal theories of teaching. The NBTL scale contained 5 items. The Cronbach alpha for this scale was .62 (N=63). The scale that focused on teaching approaches consisted of 4 items, with a Cronbach alpha of .66 (n=63). Motivation scale contained 4 items. The Cronbach alpha was .63 (n=63). The personal theories of teaching scale contained 4 items and the Cronbach alpha was .64 (n=63). George & Mallery (2003) provide the following rules of thumb for Cronbach alphas ">.90 – excellent, >.80 – good, >.70 – acceptable, >.60 – questionable, and >.50 – poor" (p.231). Tavakol and Dennick (2011) state that various reports cite acceptable values for alpha as ranging from .70 to .95. Based on the above criteria and the observation that the internal consistency was not of acceptable level, the researcher made the decision to conduct the analyses of individual items within the scale, rather than the composite score of the individual scales.

4.7 Data analysis

4.7.1 Core study

Data was analysed using SPSS19. Basic descriptive analyses were conducted. One way Analysis of Covariance (ANCOVA) with pre-test scores as a covariate was then conducted to determine the effect of GraphoGame training on the performance of learners on the Orthography and Spelling tests. For the purpose of analyses the intervention groups were combined in order to increase the statistical power that was associated with small Ns in some intervention groups. Three intervention groups were formed; learners only who had received GraphoGame training (LG), learners and teachers who had received intensive GraphoGame training and those who had received minimal training (LG + TIG & LG +TG) and lastly teachers only who had received GraphoGame

training, whether intensive or minimal (TIG & TG) versus the control group, which did not received GraphoGame exposure. The hypotheses that governed the analyses were that (1) Learners who were exposed to GraphoGame either by playing the game directly or indirectly through their teachers who played the game would show greater mastery of spelling than learners that had not been exposed. (2)Influence of GraphoGame would be less prominent for the Orthography test (3) there will be no impact of GraphoGame on the mathematics and vocabulary tests.

4.7.2 Teacher quantitative data analysis

Quantitative analyses were conducted using basic descriptive statistics, correlation analyses and regression analysis. More advanced forms of regression analyses in the form of moderation analysis were also conducted. These analyses were conducted using Statistical Package for Social Sciences (SPSS). The moderation analyses were conducted using the PROCESS macro developed by Andrew Hayes in order to integrate the Preacher and Hayes moderation tools into a convenient menu (Hayes & Matthews, 2009). This programme was downloaded into SPSS from Andrew Hayes' website, https://www.afhayes.com. It enables the process of calculating more advanced regression techniques much easier (Hayes, 2012). Field, 2012 defines moderation as "the combined effect of two variables on another, an interaction effect" (p.395). The computational procedure PROCESS can conduct moderation and mediation analyses as well as their combinations and can be used with SPSS and Statistical Analysis Software (SAS). It estimates the coefficients of regression models using Ordinary Least Squares (OLS) regression (for continuous outcomes) or logistic regression (for dichotomous dependent variables). PROCESS can accommodate up to 4 moderators and ten mediators simultaneously (Hayes, 2012).

There are various levels of moderation analyses available. In this study, simple moderation was used. The decision to use these analyses techniques were based on Process' ability to simultaneously include teacher variables, GraphoGame intervention groups and learner pre-test scores and provide measures of effect size and interaction. In the first design moderation was conducted to determine if teacher variables would moderate learner pre-test scores and impact learner post-test scores. In these analyses learner pre-test scores were used as the focal predictor, teacher characteristics and beliefs were used as moderators and learner post-test scores were used as the outcome variable. These analyses were conducted for learners and teachers in the control group only.

In the second design moderation was conducted to find out if GraphoGame intervention would have an impact on literacy acquisition of learners by moderating the relationship between teacher variables (focal predictor) and learner post-test scores for both the Spelling and Orthography tests, when learners pre-test scores were used as a covariate. The moderator (type of GraphoGame intervention teachers received) was a dichotomous

variable. Simple moderation analyses were conducted with a single dichotomous variables consisting of any one or possible combinations of the teacher groups. In this study the following combinations were used: CG vs. TG (coded CG=0, TG=1); CG vs TIG (Coded CG=0, TIG = 1) and TG vs. TIG (code TG=0, TIG=1). The output file from PROCESS consists of all the regression coefficients including the interaction (between the focal predictor and the moderator), their model coefficients or standard errors, R-square change due to the interaction if the adjustment for heteroscedastisity was not selected (HCE3) was not selected and the simple slopes estimates if requested (Hayes, 2012). The most important of these is the moderation model with interaction (the coefficient for the product of the independent variable and the moderator) as well as its test of significance.

The visual representation of the interaction is made possible by the production of outcome values (Yhat values) predicted from the model for various combinations the focal predictor and the moderator. In this study, these yhat values have been plotted and presented as simple slope graphs. These show the effect of the moderator at different levels of the focal predictor: low (mean -1 standard deviation, mean and high (mean +1 standard deviation). These plots have been presented in the subsequent sections (chapter four). The section also contains moderation tables, which are tables of regression coefficient containing the b-value (effect) for each predictor, the associated standard errors (adjusted for heteroscedasticity, HCE3). Each b-value presented has been compared to 0 using the t-test, computed from the beta and divided by its standard error and adjusted for heteroscedastisity. Confidence intervals for b, which were produced using bootstrapping are also presented.

In this study, in order the observe the effect of teacher variables on learning outcomes, the analyses was limited to the control children only because it was believed that the effect of teacher variables would be best observed with this model. It was believed that including children who had played GraphoGame in the sample would confound the results of the study, as the effect of children playing GraphoGame would need to be accounted for. Based on this reasoning a decision was made to exclude learners who had played GraphoGame from the analysis since the focus was to determine how teacher variables would impact literacy acquisition of the learners.

In order to determine if GraphoGame interacts with teacher variables to impact literacy outcomes, all three teacher groups were used in the analyses, teachers in the control group (c), teachers who had received intensive GraphoGame instruction (TIG) and teachers who had received minimal instruction (TG). These subgroupings were conducted for two main reasons: (a) to compare the performance of learners with teachers in the control group verses teachers in the intervention groups and (b) to determine, under which intervention conditions/instruction, intensive or minimal instruction GraphoGame would be most effective. The latter point was important to determine because it would give some insight into how best teacher training with GraphoGame should be conducted in order to obtain greater effects of the

game in the future. However, one of the major disadvantages of analysing the data in this way is that it reduced the sample size sample, with consequent limitations on statistical power. This in turn increased the risk of failure to detect an effect such as influence of a teacher variable on a learner outcome.

4.7.3 Teacher qualitative data analysis and presentation style

Qualitative analysis was conducted for the focus group discussion data. The goal of conducting the focus group discussions was to collect in-depth information from a small number of teachers that were part of the study. Bryman (2004) suggests the following five stages of qualitative data analysis: (1) organizing the data (2) identifying themes, patterns or categories (3) testing the emergent hypothesis against the data (4) searching for alternative explanations of the data (5) writing the report. In this study the first phase of data analysis was to transcribe the recorded interviews. This process was solely conducted by the researcher. During this process the researcher transcribed the interviews verbatim. The researcher then carefully read through the transcriptions, while simultaneously listening to the recordings using headphones as a way of checking the transcription had been correctly done. The researcher then read through without the headphones in order to understand the text. During this process, general themes were identified for the various questions that were asked. The extracted data was then presented in a thematic chart.

Data analysis for the current study relied primarily on a technique adopted from qualitative data analysis: Grounded Theory. Bryman (2004) defines grounded theory as "as theory derived from data, systemically gathered and analysed through the research process" (p. 401). He identifies two central features of grounded theory as firstly concerned with the development of theory out of data and secondly the approach is iterative or recursive. This means that data collection and analysis proceed in tandem, repeatedly referring to each other. In the current study, various themes were identified and propositions developed (general statements grounded in the data) from the transcribed focus group discussion data.

The method of qualitative data presentation used in the current study was the excerpt presentation style. Also known as the "preservationist approach" this style of presentation involves the presentation of the original speech of the participants. Corden and Sainsbury (2006) explain that this method of presenting qualitative data helps preserve the participant's original thoughts. They further identify benefits of using the excerpt method, which include (1) they provide evidence of the researchers' assertions and help strengthen credibility and (2) they help the readers to understand complex processes by which the participants make sense of their lives. Excerpts help in understanding why participants had particular views, their assumptions and ambivalences and uncertainties; (3) they show particular forms of general phenomena; (4) they enhance the quality of a report; (5) they provide a better representation of the depth of feeling; (6) they provide a voice for the participants this enables the participants to speak for themselves. In this study, the excerpts that were

included in the paper were chosen based on the central issues they represented or if they appeared to be important or interesting. In reporting the results, the author's narrative is first presented after which the verbatim quotations are presented. In order to make a distinction between the two, the latter are indented and presented with open and closed inverted commas.

4.8 Ethical concerns

Written permission to work with the schools was obtained from the relevant department of the Ministry of Education, as per Government requirement. This permission gave the researcher authority to work with both the teachers and the learners in the schools. Teachers and learners were consulted as to their willingness to participate in the studies. They were informed that they could withdraw when they felt the need to. Only one learner withdrew from the study. Ethical approval to conduct the larger study (RESUZ) was obtained from the University of Zambia Research Ethics Committee (Humanities and Social Sciences). Similar procedure was conducted for this PhD study with the teachers. Permission and ethics approval was granted for both studies.

5 PRESENTATION OF FINDINGS

5.1 The core study

Descriptive analyses from the core study revealed that there was an increase in learner scores from pre-test to post-test for all the tests except for the PVT. Descriptive results comparing the post-test scores of the control group with the intervention groups revealed that mean scores for the intervention groups were higher than those of the intervention groups on both the Orthography and Spelling tests. In order to determine the impact of GraphoGame, one way ANCOVA analyses were conducted of post-test scores on the decoding and orthography tests using pre-test scores as a covariate. Table 2 below presents the means of the Spelling and Orthography test post scores derived from these analyses.

TABLE 2 Post-test scores for the Spelling and Orthography test. Control vs. various intervention conditions

Spelling			
	N	M	SD
No GraphoGame intervention (C)	147	8.69	4.20
Students only played the game (LG)	38	10.13	4.33
Students and teachers played the game (LG+TG & LG+TIG)	63	10.35	5.23
Teachers only played the game (TG+TIG)	42	10.79	5.41
Orthography	N	M	SD
No GraphoGame intervention (C)	160	22.18	7.04
Students only played the game (LG)	41	23.66	7.75
Students and teachers played the game (LG+TG & LG+TIG)	68	21.49	8.20
Teachers only played the game (TG+TIG)	43	23.23	9.85

Analyses were further conducted to determine whether post-test group means were different after adjusted pre test scores in the means of the intervention groups for the Spelling, Maths and Orthography tests. The first analyses were conducted for the control versus the various intervention combinations (LG - students only played the game, LG+TG and LG+TIG - both the students and the teachers played the game and TIG+TG - teachers only played the game). Secondly, a comparison between the control group and the individual intervention groups (C vs LG, LG&TG, LG&TIG, TIG and TG respectively). The results revealed that the effect of GraphoGame was greater when both the teacher and learners played GraphoGame. The variance accounted for by playing GraphoGame in this study was 6% (Jere-Folotiya et al. 2014).

5.2 Teacher data

5.2.1 Descriptive results

The general demographic information of the teachers (N=63) was obtained through the teacher questionnaire. In some instances teacher data was missing. This will be reflected in the reduced N value for some of the analyses. The descriptive results for the demographics are presented below.

Age of teachers

The teachers in this study were of varying ages. Figure 2 presents the teachers' age distribution.

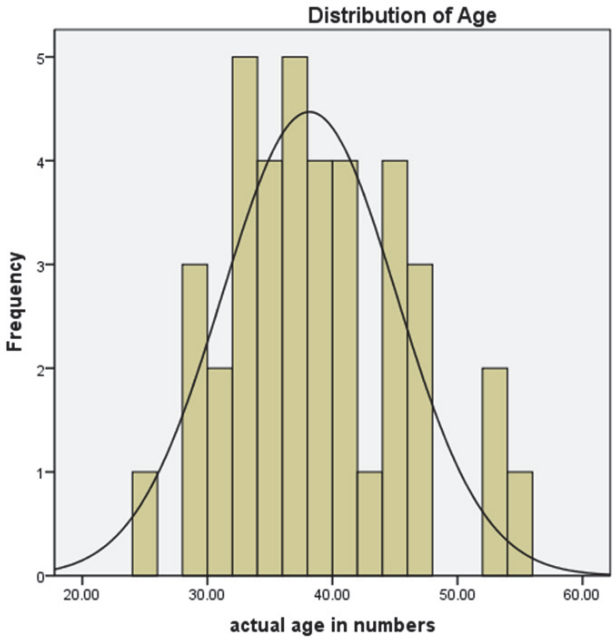

FIGURE 2 Age distribution of teachers

The age range of the teachers (N = 39) was between 25 and 54 years (M = 38.15, SD = 6.96). Skewedness was .45 (SE = 0.38) and kurtosis of -.14 (SE = 0.74). A distribution of the teachers' age is shown in Figure 2 above. All the teachers were female.

Number of learners

The number of learners taught by the teachers in each class varied from 28 to 78, N=39, (M= 49.74, SD= 11.52). The skeweness was 0.21 (SE = 0.37) and a kurtosis of -2.08 (SE = 0.74). Figure 3 below shows the distribution of learners.

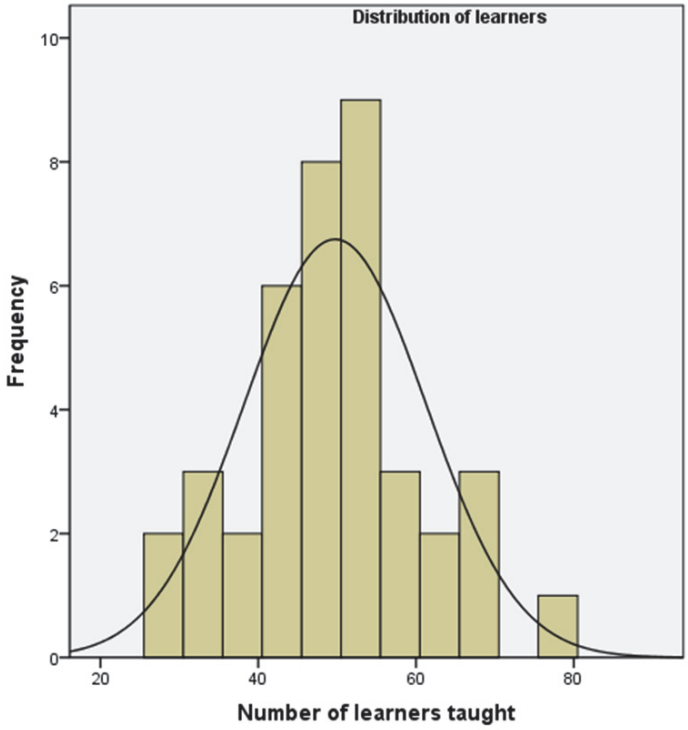

FIGURE 3 Distribution of number of learners

Number of Grade one classes taught

Fifty three percent (53%) of these teachers in the study had only one Grade one class to teach. The remaining 47% had two Grade one classes. The latter group had one session in the morning and the other session at either mid-morning or afternoon. None of the teachers taught multi-grades. Seventy six percent of the teachers reported spending one hour per day on teaching literacy, 24% indicated that they spent more than one hour but less than two hours.

Teaching Experience

This study viewed teaching experience from three main perspectives; general teaching experience, experience teaching first grade learners and experience teaching first grade literacy in the local language.

General teaching experience

General teaching experience was viewed as the number of years a teacher had been teaching for, regardless of the grade. Figure 4 below shows the distribution of the general teaching experience of the teachers in the sample. The results show that the teachers had a wide range of teaching experience 3-29

years, N=40, M=10.35, SD=7.17 Crosstabs showed that 11% of these teachers were less than 30 years of age, 55% were between the ages of 30 and 40 years and 34% were above 40 years of age. Fifty eight percent (58%) of this sample had between 3 and 10 years teaching experience, 26.6% had between 11 and 20 years teaching experience and 15.4% had between 21 and 29 general work experience.

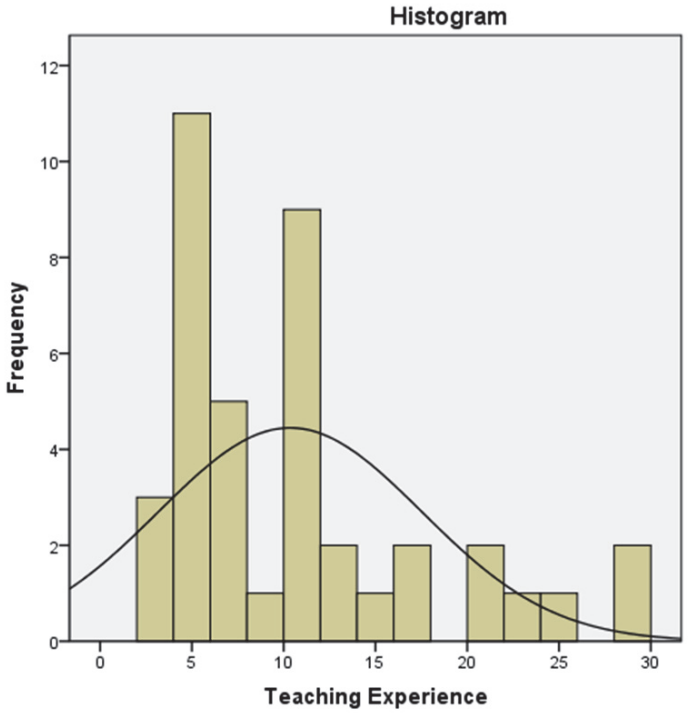

FIGURE 4 Distribution of general teaching experience

Experience teaching first grade learners

This was viewed as the number of years a teacher had taught first grade learners during their teaching career. Results were as follows: N=38, range 1-15, Mean=3.21, SD=2.78. Skewness =2.66 (SE.38), Kurtosis = 8.71 (SE=.75). Figure 3 below shows the distribution of years. Cross tabulation with age showed that 35% of the teachers had at least 2 years teaching experience with first grade learners. The teachers were between the ages of 25 and 41. Seven percent of the teachers (of varying age groups) had one year of teaching experience with first grade learners. Figure 5 below shows the distribution.

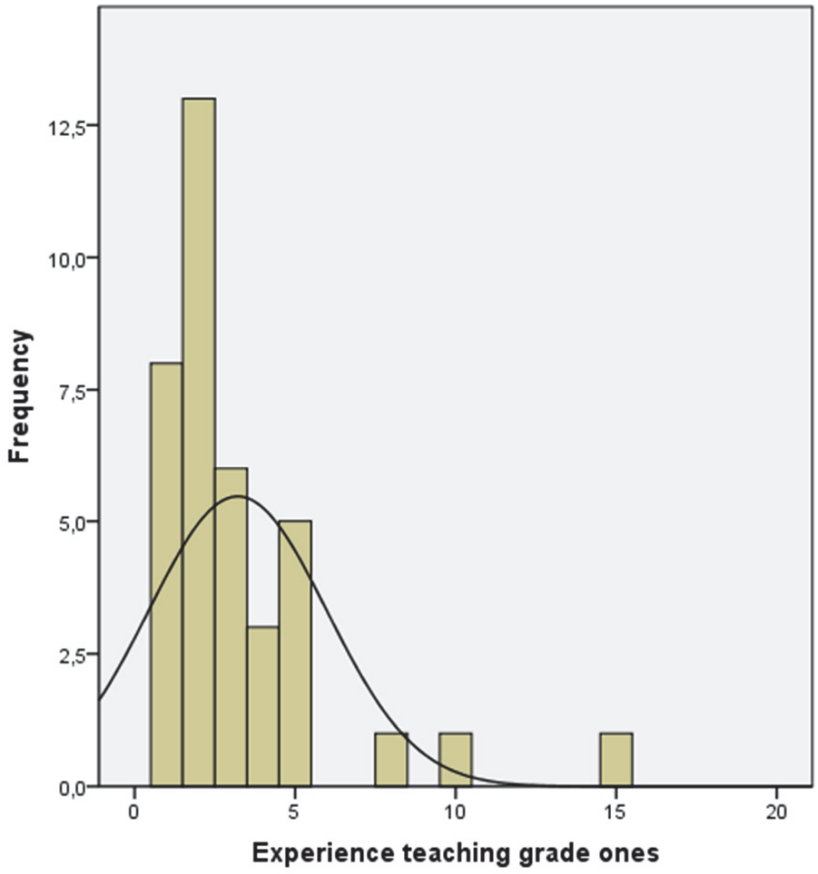

FIGURE 5 Distribution of teacher's experience teaching first graders

Experience teaching literacy in the local language

This was considered as the total number of years a teacher had taught first grade learners literacy in any one of the seven local languages, N=38, M=2.89, SD=2.24, Skewness = 2.31 (SE = .75) Kurtosis = 2.31 (SE = .75). Figure 5 shows the distribution of years. Cross tabulations revealed that 30% of the teachers had one year experience teaching literacy in the local language and 32% had 2 years' experience. The distribution of teachers varied across the different age groups.

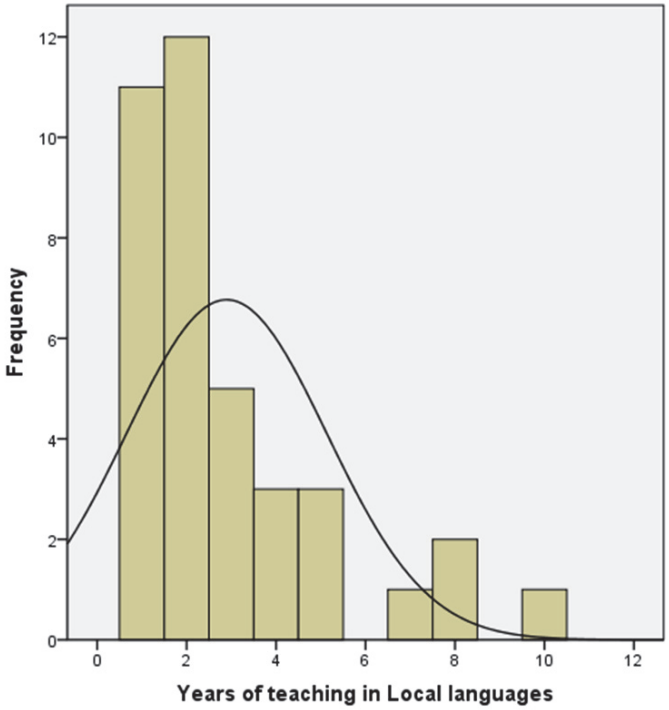

FIGURE 6 Distribution of experience teaching literacy in the local languages

Teacher training and the local language

Teacher training was divided into two main categories; content-specific training and general teaching qualifications. The former referred to PRP courses teachers had been trained in. Table 3 below presents the percentage of teachers that were trained in the various PRP courses.

TABLE 3 Frequency results for PRP training

Item	percentage
Training in use of PRP	
NBTL	31.6%
SITE	10.5%
ROC	1.6%
NBTL + SITE	3.2%
NBTL + ROC	9.5%
NBTL+ SITE + ROC	20.6%

The table above shows that more than half of the teachers (31.6%) were trained in the use of NBTL. The percentage of teachers trained in all three courses was quite high 20.6%.

Mother tongue of teachers

Percentages for mother tongue were also computed. Table 4 below presents these percentages.

TABLE 4 Frequency for mother tongue

Item	percentage
Mother tongue	
English	3%
Bemba	22%
Nyanja	12%
Tonga	5%
Lozi	10%
Others	14%

The teachers were asked to choose which of the listed languages they considered their mother tongue. The teachers chose the languages in the following order of decreasing percentage: Bemba, followed by ciNyanja, siLozi, ciTonga and lastly English. Ten percent of the respondents chose the "other" option. The teachers were not asked to indicate what the "other" represented.

Teacher qualifications

The following table 5 shows the percentage of varied qualifications possessed by the teachers in this sample.

TABLE 5 Frequency results for teacher qualifications

Item	percentage
Teacher qualifications	
Primary teacher certificate	61%
Primary teacher diploma	5%
Primary teacher certificate + advanced certificate	5%
Primary teacher certificate + primary diploma	20%
Primary teacher certificate + special education diploma	2.6%
Primary teacher certificate + special education diploma + Special education certificate	2.6%
B. A. Education	2.6%

Results in the above table show that the qualification of the teachers ranged from primary teacher certificates to primary school diplomas and special education diploma. There was only one degree holder. Some teachers had more than one certificate or both a certificate and a diploma. More than 50% of the teachers had a primary teacher certificate as the only teaching qualification.

5.3 Responses to the Likert scale items

The section will present responses to the Likert scale questions. Initially, the researcher aimed at using the composite scores for each scale to conduct the analysis. However, due to the low internal consistency of the scales, a decision was made to use individual items within the scales for analysis. The tables below represent the five point scale descriptive results for the individual items in the teacher questionnaire. .

5.3.1 Teaching approaches

Table 6 below presents the distribution of responses across the five response options on the Likert scale for the teaching approaches domain.

TABLE 6 Responses to the teaching approaches sub-scale (N=63)

Statement	SA	A	DN	D	SD
In the classroom the teacher is the only provider of information	44.4	49.2	----	3.2	3.2
For effective learning to occur, the teacher needs to be in control of the direction of learning	3.2	4.8	1.6	41.3	49.2
In the teaching process the learners are more important than the teachers	19	34.9	1.6	34.9	9.5
Paying attention to the pupils' point of view is the key to their good performance in school	41.3	52.4	3.2	3.2	----

Note. SA = Strongly Agree, A = Agree, DN = Do not know, D = Disagree and SD = Strongly Disagree

The items in this scale made reference to two main types of teaching approaches, learner centred and teacher centred approaches. Results from this domain showed that 95.1% of teachers believe that the teacher is the only provider of information in the classroom, (M=9.95, SD=.22, mode 5, median 5). In addition 91.3% do not believe that the teacher alone should be in control of the learning process, (M=9.08, SD=.28, median 1, mode 1). With regard to whether teachers or learners are more important in the classroom, 50.3% believed that in the teaching and learning process learners are more important than the teachers (M=9.50, SD=.50, median 4, mode 4). As a follow up to this point, 96.5% believe that learners' opinions matter in the classroom, (M=9.97, SD=.18, median 4, mode 4).

5.3.2 Teacher Motivation

Table 7 below represents the distribution of responses (in percentages) of the motivation scale.

TABLE 7 Responses to teacher motivation sub-scale (N=63)

Statement	SA	A	DN	D	SD
One of the best things about teaching is seeing the pupils learn	71.4	28.6	-------	------	-------
My salary is adequate for the amount of work I do	3.2	9.5	7.9	39.7	39.7
I am personally responsible for part of the education of every pupil I teach	47.6	39.7	3.2	7.9	1.6
I set tougher standards for myself than the head of school sets for me	6.3	50.8	20.6	19	3.2

Note. SA = Strongly Agree, A = Agree, DN = Do not know, D = Disagree and SD = Strongly Disagree

The motivation domain focused on both intrinsic and extrinsic motivation of the teachers. All the teachers (100%) believe that they are motivated when their learners acquire the knowledge they are imparting (M=10, SD=.00, median 5, mode 5). They also believe that they are personally responsible for part of the education of every pupil they teach (92%), (M=9.92, SD=.27, median 4, mode 5). The teachers believe that they set tougher standards for themselves than their head of school does for them (80.1%) (M=9.8, SD=.40, median 4, mode 4). However, 81.1% believe that their salary is inadequate for the amount of work they are expected to do as first grade teachers (M=9.91. SD=.39, median 2, mode 1).

5.3.3 Personal theories of teaching

The percentage of teacher responses on the personal theories of teaching sub-scale is presented in table 8.

TABLE 8 Responses to teacher motivation sub-scale (N=63)

Statement	SA	A	DN	D	SD
Every pupil can learn	1.6	3.2	1.6	34.9	58.7
Teachers must take into consideration the individual differences of pupils when teaching	55.6	42.9	-----	1.6	-----
If teachers take time to listen and understand their pupils, they will change their teaching to cater for individual pupils	52.4	44.4	1.6	------	1.6
Each child brings to the classroom unique characteristics which the teacher should discover and build on when teaching	44.4	49.2	----	1.6	4.8

Note. SA = Strongly Agree, A = Agree, DN = Do not know, D = Disagree and SD = Strongly Disagree

With regard to the personal theories of teaching, the teachers were asked questions that related to various teaching philosophies. 97.2% of the teachers do not believe that every child can learn (M=9.03 SD=.17, mode 1 median 1). However, they do agree (95.8 %), (M=9.85, SD=.93) that each learner brings to the classroom unique individual differences, mode 4 and median 4. They also agree that teachers should take time to listen to and understand their learners (93.7 %) (M=9.83, SD=.94, mode 5 and median 5). They also agree (91.6 %) that if teachers take time to know their learners, they will change their teaching to cater for individual learners (M=9.8, SD=.94, mode 5 and median 5).

5.3.4 Literacy curriculum (NBTL)

Teachers' responses to the literacy sub-scale (NBTL) are presented in table 9 below.

TABLE 9 Responses to the NBTL subscale (N=63)

Statement	SA	A	DN	D	SD
Children learn to read faster when they are taught initial literacy in a local language from the beginning than when They are taught in English.	50.8	41.3	------	6.3	1.6
Learning to read in ciNyanja is difficult for children who do not speak ciNyanja at home.	7.9	22.2	1.6	42.9	25.4
Teaching initial literacy in ciNyanja is difficult for a teacher whose mother tongue is not ciNyanja	14.3	36.5	1.6	22.2	25
Emphasis on the letter sound correspondence in the NBTL programme is effective in helping children learn how to read	61.9	36.5	1.6	------	----
The version of ciNyanja in the NBTL makes it difficult for pupils in Lusaka to acquire literacy skills.	17.5	65.1	1.6	11.1	4.8

Note. SA = Strongly Agree, A = Agree, DN = Do not know, D = Disagree and SD = Strongly Disagree.

Of the 63 teachers, 94.8% believe that children learn to read faster in a local language than when they are taught in English, (M=9.84, SD=.93, mode 5 and median 5). Approximately 97.2% of the teachers believe that the use of letter-sound correspondence in the NBTL is effective in helping children learn how to read, (M=9.97, SD=.17, mode 4 and median 4). Furthermore, 87.4% of the teachers believe that the CiCewa that is used in the NBTL programme is very difficult for learners, (M=9.89, SD=.33, median 4 and mode 4). However, 68.9% do not believe that it is difficult for children to learn to read in CiNyanja if it is not their mother tongue (M=9.19, SD=.94, median 2, mode 2). The teachers were divided on whether teaching in CiNyanja is difficult for those teachers whose mother tongue is not CiNyanja, 47.7% agree (more than half) while 50.8% disagree (M=9.58, SD=.49, mode 2 and median 2).

5.3.5 Correlations of teacher variables

Teacher beliefs

There was a significant relationship between the belief that teaching ciNyanja is difficult for teachers whose mother tongue is not ciNyanja and the belief that learning to read in ciNyanja is difficult for learners whose mother tongue is not ciNyanja, r = .55, <.01. The belief that the teacher needs to be in control of the direction of learning correlated with the two beliefs (a) the belief that learning to read in ciNyanja is difficult for children whose mother tongue is not ciNyanja, r = .28, p<.05 and (b) the belief that teaching initial literacy is difficult for teachers whose mother tongue is not ciNyanja, r = .35, p<.01. The belief that paying attention to pupils' view is the key to their good performance in school was significantly correlated to the belief that in the teaching process, learners are more important than teachers, r = .43, p<.01. A significant correlation was also observed between the teachers belief in the adequacy of their salaries and the belief that letter-sound correspondence used in the NBTL programme is effective in helping children learn to read, r = .26, p<.05. The belief that not all children can learn was correlated with 3 teacher beliefs (a) the belief that children learn to read faster when they are taught literacy in the local languages than when they are taught in English, r = -.29, p<.05, (b) the belief that the teacher is the only provider of information in the learning process, r = -.33, p<.05 and (c) the belief that teachers are motivated when they observe that learning has taken place, r =.27, p<.05.

The belief teachers must take into consideration individual learner differences was correlated with (a) the belief that teachers set higher standards for themselves than the Head of the school does, r = .38, p<.01 and (b) the belief that emphasis on the letter-sound correspondence is effective in helping learners learn to read, r = .36, p<.05. The belief that teachers will change their way of teaching to cater for individual learners if they take time to understand their learners correlates significantly with (a) the belief that paying attention to the learners is the key to their good performance, r = .36, p<.01, (b) the belief that as teachers they feel they are partly responsible for educating the learners, r = .32, p<.05, (c) the belief that as teachers they set tougher standards for themselves than their Head teacher does, r = .36, p<.01 and (d) the belief that teachers must take into consideration learner individual differences when teaching, r =.27, p<.05. This and the preceding paragraphs have presented significant results. Appendix 3 includes the non-significant results.

Teacher characteristics

A significant correlation was observed between the number of classes taught and the number of learners, r =.42, p<.01. The age was significantly correlated to (a) general teaching experience, r =.82, p<.01 (b) experience teaching Grade one learners, r=.36, p<.05 and (c) experience teaching literacy in the local languages, r=.37, p<.05. Experience teaching Grade 1 learners was correlated with (a) general teaching experience, r = .49, p<.05 and (b) teaching experience in the local

language, r =.39, p<.01. Experience teaching in the local languages was correlated with their experience teaching first grade learners, r = .83, p<.01. These significant results and the non-significant results are presented in Appendix 4.

5.4 Open ended questions

The questionnaire also consisted of five open ended questions. The responses to these questions were coded and entered into SPSS 19. There were five open ended questions. These questions were asked because it gave the teachers an opportunity to express their own thoughts when responding to questions. This is unlike the previous section of the questionnaire containing the Likert scale questions, which focused teachers to choose a response. Furthermore, it was hoped that responses to these questions would provide greater insight into the teachers' perspective on what motivates them, their teaching approaches, their likes, dislikes and challenges. The subsequent paragraphs explain these results.

The first question was focused on teacher motivation. The teachers were asked what motivates them when they are teaching. This question was asked so as to establish different factors that motivate them, with the aim of establishing whether these factors are intrinsic or extrinsic. Two main themes were established. More than half of the teachers (72%) stated that they were motivated when their learners acquired the knowledge they were teaching. The remaining 28% of teachers indicated that they were motivated when they achieved the learning objectives of a lesson.

The second question asked what the teachers thought the role of the learners should be in the teaching and learning process. The reason why they were asked this questions was to determine whether the respondents were learner centred or teacher centred. This question would help validate the responses given in the teaching approaches Likert sub-scale. Forty nine percent of the teachers responded that the learner's role should be to participate by asking questions and giving their opinions, while 38% stated that they should pay attention to the teacher by listening and following instruction. The remaining 18% indicated that the role of the learners should be to complete tasks they are given correctly.

The main focus of the third question was to find out what teachers appreciated most about their profession. Sixty eight percent (68%) indicated that the role model status that is given to them by society, is what they appreciate the most. They indicated in their responses that it was mostly learners and parents that showed this appreciation. They consider themselves educators of the nation and they appreciate this recognition. The remaining 32% stated that they appreciated the interaction they have with their learners because they learn a lot from them.

The fourth open ended question asked what the teachers disliked most about being a teacher. The reason for asking this question was to identify factors that could contribute to teachers' demotivation. Most of the teachers (46%), cited the lack of appreciation from Government as the major dislike. Some teachers indicated that as first grade teachers they felt they had too much work to do

(32%) and they did not like this. A much smaller percentage focused on the learners. Seventeen percent (17%) of the teachers indicated that they did not like it when their learners performed poorly.

The last question focused on the challenges that teachers were experiencing. The question asked them to indicate what their greatest challenge was as first grade teachers. More than half (56%) indicated over enrolment of learners, which then resulted in inadequate teaching and learning materials as their greatest challenge. Some teachers (39%) cited general difficulties implementing NBTL as their greatest challenge. In this regard they made reference to difficulties they experience in implementing the NBTL through the use of the local language, difficulties implementing all the activities in NBTL and incomplete NBTL kits. Five percent (5%) of the teachers indicated the lack of family support as their greatest challenges.

In order to determine the effect of teacher beliefs and characteristics on literacy acquisition of learners, the teacher data had to be matched with the learners' data. The current study focused on only two of the cognitive tests that were administered during the core study; the Orthography and Spelling tests. The paragraphs below present learner data for these two tests.

5.4.1 Correlations with quantitative measures

The open ended questions correlated with only two quantitative measure. The responses they gave to the question, "What do you appreciate the most about being a teacher?" correlated with (a) the number of learners in the classroom, r =-.38, $p<.01$ and (b) their responses to the question "What motivate you to teach?" r=.31, $p<.05$.

5.5 Learner data

This section presents descriptive statistics for the performance of learners on Orthography and Spelling tests for learners in the control group only. Table 10 below presents descriptive results for the baseline and post-tests scores for the Orthography and Spelling tests.

TABLE 10 Means, standard deviations and range of scores for learners' baseline and post test scores on Spelling and Orthography tests for learners in the control group only

Measure		N	Mean	SD	Range
Spelling	Baseline	299	7.58	3.29	1-19
	Post-test	160	8.59	4.10	2 - 20
Orthography	Baseline	314	15.44	7.73	-8 - 32
	Post-test	160	22.18	7.04	2 - 35

An increase in the mean scores from baseline to post-test was observed for both tests. Important to note is a reduction in the sample size from baseline to post-test for both instruments. This attrition can be attributed to factors such as absenteeism. These factors will be discussed in the subsequent chapter. Skewness for Orthography baseline scores is -0.29 (SE = 0.14), kurtosis is -0.63 (SE = 0.29). These results show that the distribution of Orthography baseline scores was not normally distributed. The distribution graph is presented in figure 7 below. The distribution for Orthography post-test scores was also not normal, skewness is -0.49 (SE = 0.19) and kurtosis is 1.19 (SE = 0.38). The distribution for Orthography post-test scores are presented in figure 8 below.

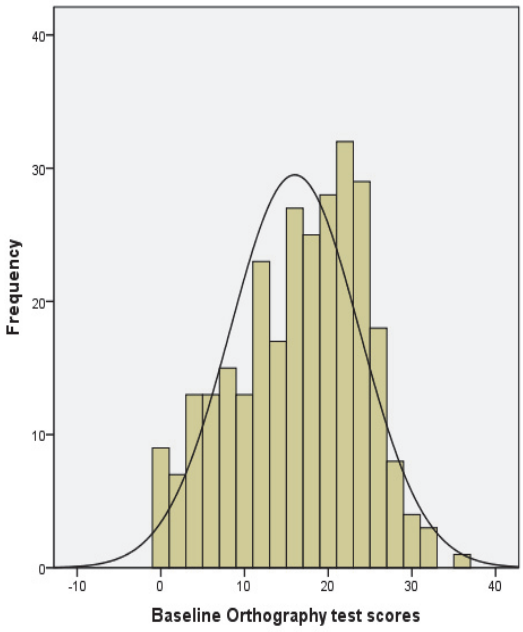

FIGURE 7 Distribution of Orthography baseline scores

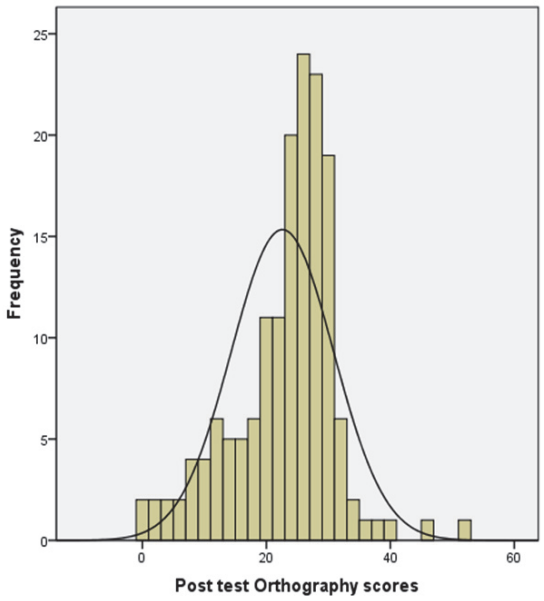

FIGURE 8 Distribution of Orthography post-test scores

The distribution graphs for the Spelling baseline and post-test scores are presented in figures 9 and 10 below. Statistical results show that the distribution for the baseline and post-test score of the Spelling test was non-normally distributed. For the baseline score skewness is 1.13 (SE = 0.15) and kurtosis is 1.51 (SE = 0.29). Spelling test post-test scores have a skweness of 0.63 (SE = .19) and kurtosis of -0.69 (SE = 0.38).

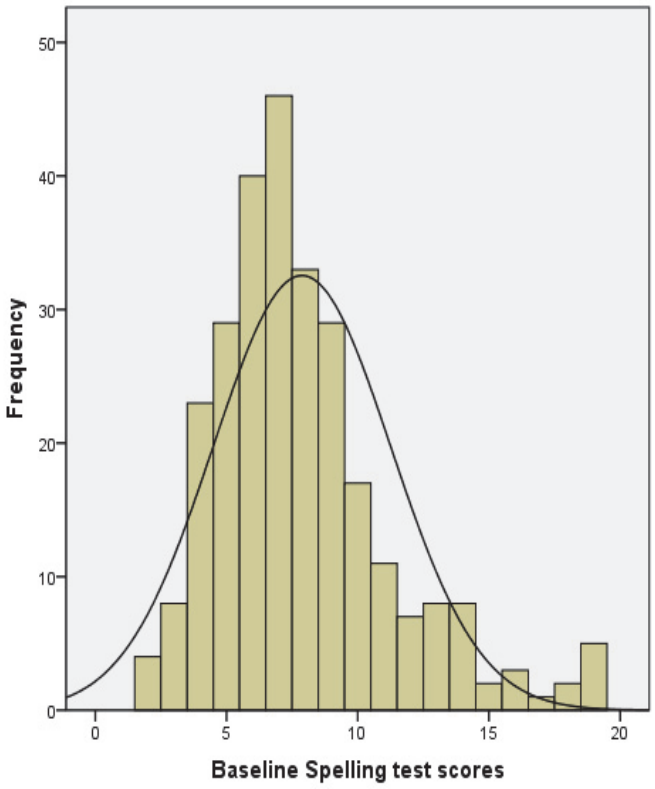

FIGURE 9 Distribution of baseline Spelling test scores

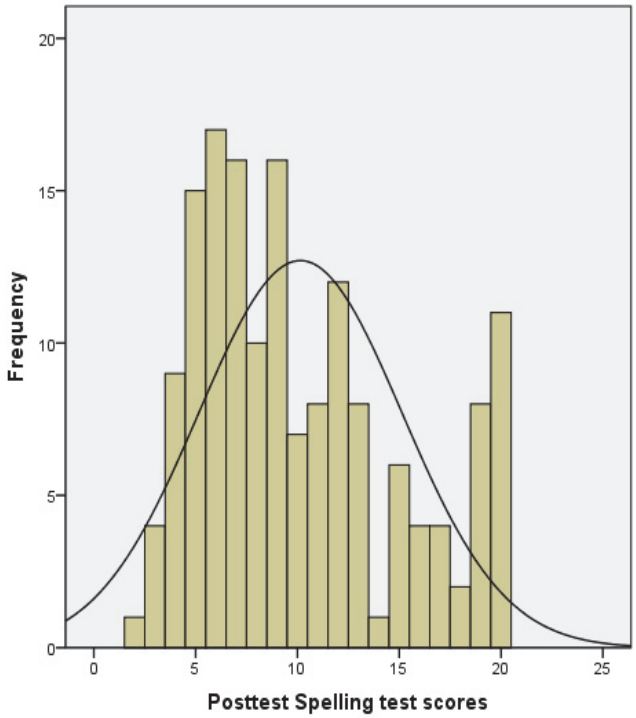

FIGURE 10 Distribution of Spelling test post-test scores

Correlations between the Spelling and Orthography tests

Table 11 below presents bivariate correlations between baseline and post-test scores on the Spelling and Orthography tests. The table also presents bivariate correlation between the two tests. Baseline and post-test scores were moderately to strongly correlated for both tests.

TABLE 11 Bivariate correlations

		Spelling		Orthography	
		Baseline	Post-test	Baseline	Post-test
Spelling	Baseline	1			
	N	299	.		
	Post-test	.65**	1		
	N	147	160		
Orthography	Baseline	.30**	.44**	1	
	N	299	160	314	
	Post-test	.32**	.42**	.61**	1
	N	299	160	160	160

**Correlation is significant at the 0.01 level (two tailed)

Correlations for the Spelling baseline and post-test scores were ($r = .65$, $p < .001$) and baseline and post-test Orthography test ($r = .61$, $p < .001$) respectively.

5.6 Inferential statistics results

This section presents results on the inferential statistics that were conducted. These include ANOVA, regression analysis, and moderation results on the spelling and orthography test. The main aim of conducting these analyses was to establish what effect teacher characteristics (from their demographic information and response to the Likert scale items) have on the learning outcomes of their learners. The pre and post test scores of learners in the control group were used in the analyses. The decision to focus on the control group learners only was made in order to avoid the influence of the GraphoGame intervention on the learners' performance, when learners played the game.

5.6.1 ANOVA and regression analyses

Analysis of Variance (ANOVA) and regression analyses were conducted to establish the effect of teacher beliefs and characteristics on the performance of the learners. The sample consisted of teachers and learners in the control group. The teacher beliefs were obtained from teachers' response to the Likert scales. In these analyses, the learners' gain scores were used. The gain scores were obtained by subtracting baseline scores from post-test scores. Similar analyses were conducted for teacher characteristics. These analyses did not produce significant results. A possible reason for the non-significant results is the lack of variance in the teachers' responses to the Likert scale questions. Similar analyses were conducted with teacher characteristics. The results were also non-significant. More advanced statistical analyses were used to test for moderation effects using GraphoGame exposure of teachers as a moderator.

5.6.2 Moderation

The first moderation analyses were conducted to determine if the relationship between learners' pre-tests (focal predictor) and their post-test scores (outcome variable) on the Spelling and Orthography tests would be altered by teacher variables (moderators). The sample consisted of learners and teachers from the control groups. These moderation analyses did not produce significant results with teacher characteristics data and teacher beliefs. Moderation analyses were then conducted for learners in the control groups and teachers in the two intervention groups (TIG and TG groups). As the purpose of this paper was to determine the effect of teacher variables on learning outcomes, the researcher focused on teachers in the intervention groups and their learners who had not been exposed to GraphoGame.

The two main teacher intervention groups that were considered in this study were the teachers who received intensive instructions and played GraphoGame (TIG) and those who received minimal instructions and played the game (TG). The teacher variables were used as focal predictors and learners' post-test scores on the Spelling and Orthography tests as dependent variables.

The learners' post-test scores were used as a measure of literacy acquisition. Their pre-test scores were used as covariates in the analyses. The major aim of conducting the analyses in this way was to determine if GraphoGame interacts with teacher variables to impact literacy acquisition while adjusting for the learners' pre-test scores. Due to the fact that there was more than one intervention group, dummy variables were created. The analyses were then conducted with different dummy variables: control group versus teachers who received intensive GraphoGame instruction (CG vs TIG); control group versus teachers who received minimal GraphoGame instructions (CGvsTG) and lastly teachers who received minimal GraphoGame intervention versus those who receive intensive GraphoGame instructions (TG vs. TIG). The significant results for these analyses are presented below. The results are presented for each of the tests.

The moderation results represented in the section below include tables of regression coefficients and the simple slope for the moderation interaction. The tables of regression coefficient contain the b-value for each predictor, the associated standard error, adjusted for heteroscedasticity (SE B), the t-value and the p-value.

Orthography test

Number of learners in the classroom

Moderation analyses were conducted for the variable that measured the number of learners teachers had in their classrooms. These analyses were conducted pairwise: CG vs. TG, CG vs TIG and TG vs. TIG. Significant results were found the CG vs TIG group.

TABLE 12 Linear model of number of learners as a predictor of Orthography post test scores, with pre-test scores as a covariate

	B	SE B	t	p
Constant	16.20 [7.22, 25.17]	4.51	3.59	p = .001
CGvsTIG	12.12 [.59, 23.65]	5.79	2.09	p = .04
No. of learners	-.03 [-.16, 11]	.07	-.41	p = .69
Interaction	-.27 [.27, .68	.11	-2.46	p = .02
Base Orthography	.48 [.29, .68]	.10	4.91	p<.001

Note: $R^2 = .42$

The significant interaction effect: b = -.27, 95% CI [.27, .68], t = -2.46, p <.05 reveals that performance of learners is moderated by GraphoGame intervention. The results show that in large classes where the teachers had received intervention (TG) the learners' Orthography post-test scores were estimated to be higher than classes of CG teachers. This interaction reveals that learners in the intervention group performed better at post-test than learners of teachers in the control group. Figure 11 below represents the simple slopes for these results.

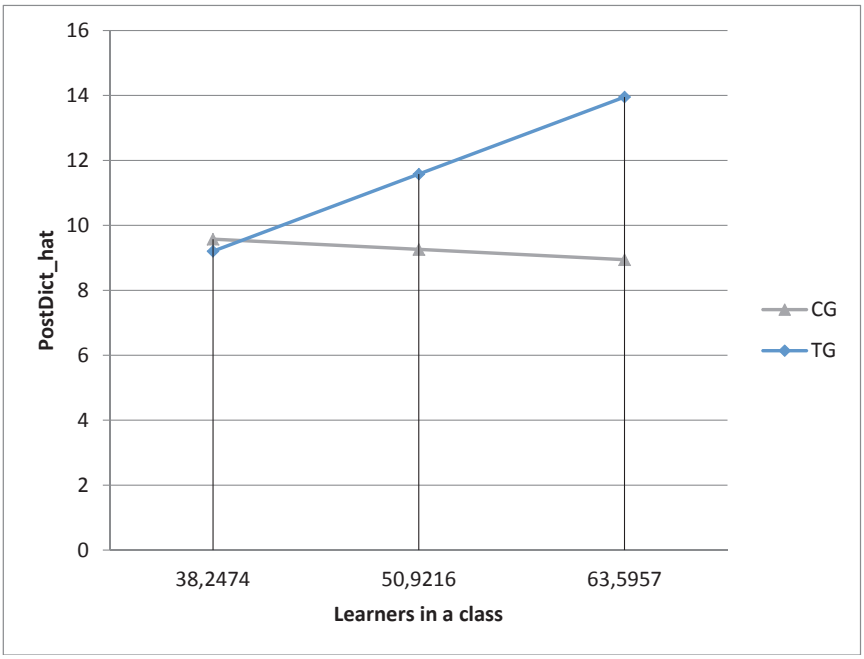

FIGURE 11 Represents simple slopes equations of the regression on control vs intervention scores on the estimated Orthography post-test, when Orthography pre-test scores have been used as a covariate.

Experience teaching Grade one learners

Moderation were conducted for the teacher variable that assessed the amount of teaching experience with Grade one learners. These analyses were conducted pairwise CG vs. TG, CG vs TIG and TG vs. TIG. Significant results were found in the TG vs TIG group comparisons.

TABLE 13 Linear model of Grade one teaching experience as a focal predictor of post-test Orthography scores, with Orthography pre-test scores as a covariate

	B	SE B	t	p
Constant	9.24 [-1.91, 20.39]	5.49	1.68	p=.10
TGvsTIG	2.80 [-7.01, 12.61]	4.83	.58	p=.57
Teaching experience	2.82 [.25, 5.40]	1.23	2.23	p= .03
Interaction	-3.48 [-6.37, -.60]	1.42	-2.45	p= .02
Base Orthography	.69 [.37, 1.02]	.16	4.29	p<.001

Note: R^2= .39

A significant interaction between Grade one teaching experience and the type of intervention the group received (TG vs TIG) b = -3.48, 95% CI [-6.37, -.60], t = -2.45, p <.05 showed that the teaching experience is moderated by the type of GraphoGame intervention. The simple slopes indicated that learners of teachers in the TG were estimated by the model to increase the post test scores as the teaching experience increased, in comparison to the TIG. The post-test scores of learners in the latter group were estimated to reduce as the Grade one teaching experience increased. Figure 12 below represents the simple slopes for these results.

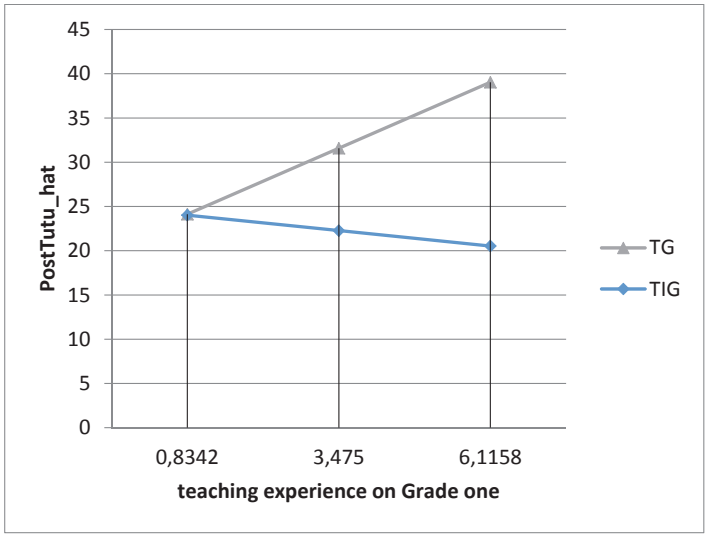

FIGURE 12 Represents simple slopes equations of the regression on TG vs TIG intervention scores on estimated Orthography post-test scores when Orthography pre test scores were used as a covariate

Teaching Grade ones in the local languages

Moderation analyses that were conducted with the teacher variable that assessed the teachers' experience teaching Grade one learners in the local language revealed significant interaction results for the following groups TG vs TIG and CG vs TIG. Table 14 below represents results for TG vs TIG group.

TABLE 14 Linear model of experience teaching Grade one learners literacy in the local languages as a focal predictor of Orthography post-test scores, with Orthography pre-test scores as a covariate

	B	SE B	t	p
Constant	14.01 [2.96, 25.06]	5.44	2.57	p<.05
TGvsTIG	4.64 [-3.17, 12.46]	3.85	1.21	p=.24
Teaching experience (local language)	2.01 [-.52, 4.55]	1.23	1.61	p = 12
Interaction	-4.42 [-7.12, -1.73]	1.32	-3.33	p= .002
Base Orthography	.50 [.37, 1.02]	.18	2.85	p =.007

Note: R^2= .51

The moderation results show that an interaction between experience teaching Grade one learners literacy in the local language and the type of intervention the teachers received, b = -4.42, 95% CI [-7.12, -.73], t=-3.33, p<.01. The results show that estimated post-test scores on the Orthography test increased for learners who were taught by teachers in the TG as their experience teaching in the local language increased. Conversely, the model estimated that post-test scores for teachers in the TIG group reduced as the teaching experience decreased. Figure 13 below presentS these results.

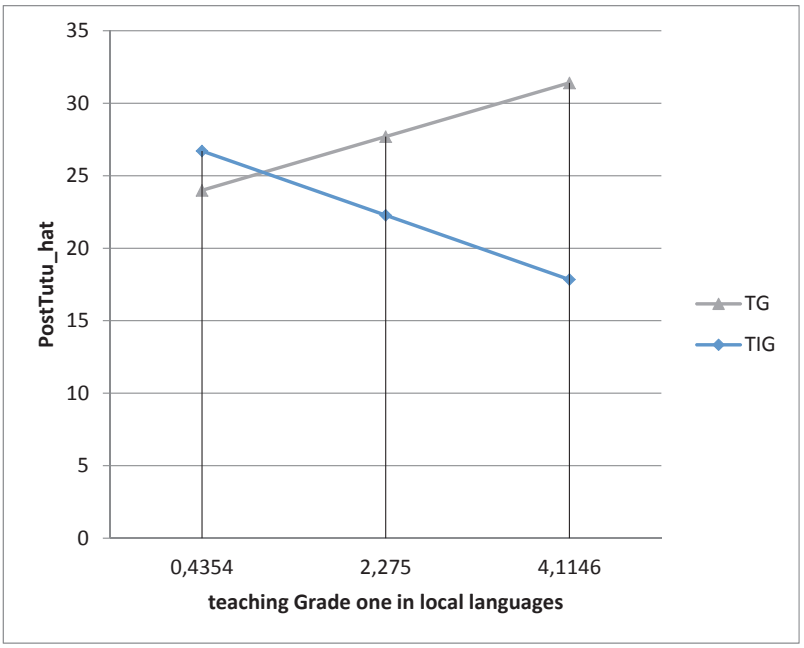

FIGURE 13 Represents simple slopes equations of the regression on experience teaching first grade learners literacy in the local languages as a focal predictor for TG vs TIG scores on estimated Orthography post-test scores, using pre-test scores as a covariate

Moderation results for the CG vs TIG with the same variable are presented in table 15 below.

TABLE 15 Linear model of experience teaching Grade one learners literacy in the local languages as a focal predictor of Orthography post test scores for CG vs TIG group, with pre-test scores as a covariate

	B	SE B	t	p
Constant	14.56 [9.78, 19.35]	2.40	6.06	p<.001
CGvsTIG	4.18 [-1.13, 9.50]	2.67	1.57	p=.12
Teaching experience (local language)	-.03 [-.58, .52]	.28	-.10	p = 92
Interaction	-2.39 [-4.13, -.65]	.87	-2.74	p=.007
Base Orthography	.50 [.30, .69]	.10	5.12	p<.001

Note: R^2= .44

The significant results above show that there is an interaction b = -2.39, 95% CI [-4.13, -.65], t = -2.74, p <.01. The results reveal that in the CG group teaching experience in the local languages did not alter the post-test scores of learners. In the TIG increased teaching experience in the local language led to decreased learner post-test scores. Post-test scores in this group were high when teaching experience was less. The figure 14 below presents the simple slopes.

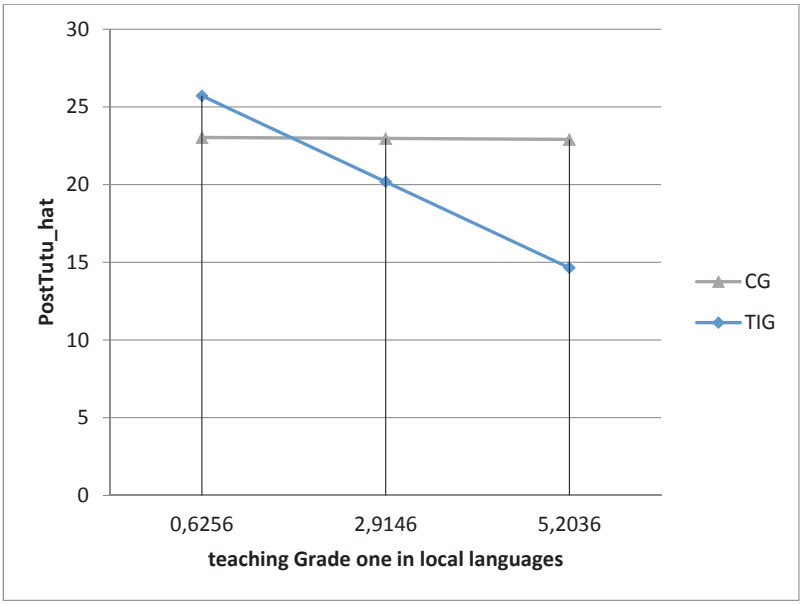

FIGURE 14 Represents simple regression slopes with experience teaching first grade learners' literacy in the local languages as a focal predictor for TG vs TIG orthography scores

Spelling test

Moderation analyses with the Spelling test were conducted using various teacher variables. The results that were significant are presented in this section. Teacher variables were used as focal predictors, learners' baseline scores as covariates and GraphoGame intervention groups as the moderator. Analyses were conducted for the pairwise groups CG vs TG, CG vs TIG, TG vs TIG.

Number of learners in the classroom

Significant results were obtained when the CG vs TG groups were used as a moderator. Table 16 below presents results the linear model this intervention group.

TABLE 16 Linear model of number of learners in the classroom as a focal predictor of spelling post test scores for CG vs TG group, with pre-test scores as a covariate

	B	SE B	t	p
Constant	3.00 [-3.16, 9.17]	3.06	.98	p=.33
CGvsTG	-8.49 [-16.26, -.72]	3.86	-2.20	p =.03
Number of learners	-.02 [-.12, .07]	.05	-.53	p = 60
Interaction	.21 [.07, .35]	.07	.00	p =.003
Base Spelling	.87 [.64, 1.11]	.12	7.39	p<.001

Note: R^2= .64

The results in the model showed that there is an interaction between the number of learners teachers have in their classrooms and GraphoGame intervention b = .21, 95% CI [.07, .35], t = 00, p<.01. An analysis of the simple regression slopes revealed that learners in classes where teachers received GraphoGame intervention (TG), learners obtained high estimated post-test results than learners in the CG. The slope for CG shows that an increase in the number of learners led to a decrease in the learners' model estimated post-test scores.

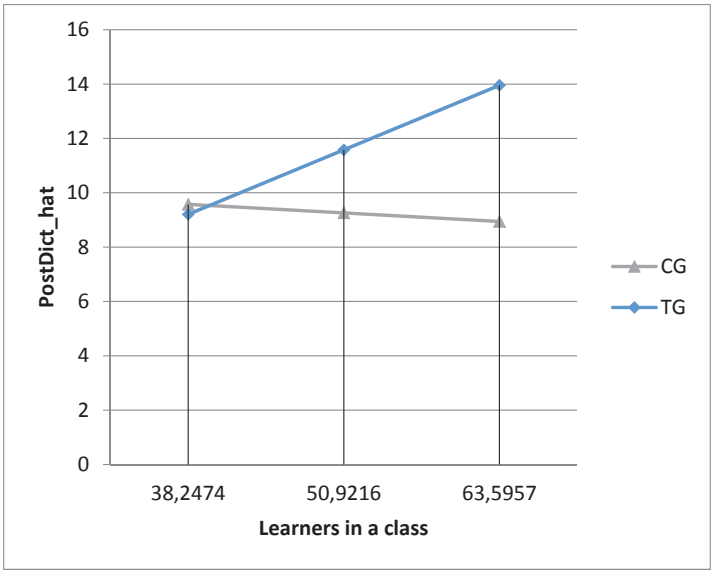

FIGURE 15 Represents simple slopes equations of the regression on the number of learners in the classroom as a focal predictor for CG vs TG scores on estimated Spelling post test scores

Experience teaching Grade one learners (CGvsTG)

Moderation results were significant for this teacher variable for the CG vs TG only. The table 17 below presents the linear model results.

TABLE 17 Linear model of number of experience teaching Grade one learners as a predictor of Spelling post test scores for CG vs TG group, with pre-test scores as a covariate

	B	SE B	t	p
Constant	2.55 [-2.00, 7.07]	2.23	1.14	p=.26
CGvsTG	4.79 [-1.94, 11.52]	3.33	1.44	p=.16
Experience teaching	-.19 [-1.12, .74]	.46	-.40	p = 69
Interaction	-2.11 [-4.14, -.07]	1.01	-2.09	p = .04
Base Spelling	.87 [.55, 1.18]	.15	5.62	p<.001

Note: R^2= .55

The results show that there is an interaction between the experience teachers have with first grade teaching and GraphoGame intervention b = -2.11, 95% CI [-4.14, -.07], t = -2.09, p <.05. Analysis of the simple slopes revealed that learners that had teachers in the TG with less experience obtained high estimated post-test scores. The learners' model estimated post-test scores reduced with the teachers' increase in Grade one teaching experience in the TG. In the CG teachers' experience teaching first grade learners did not alter the learners' estimated post-test scores. The regression slopes are presented in figure 16 below.

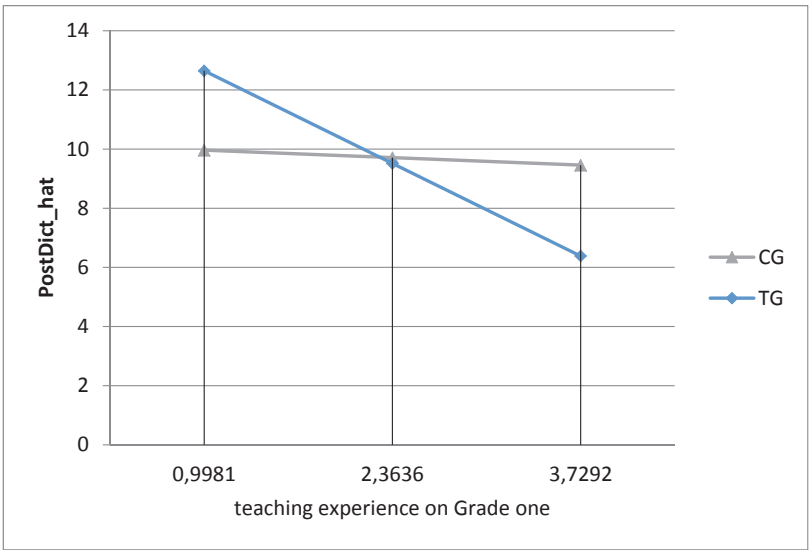

FIGURE 16 Represents simple regression slopes using experience teaching first grade learners as the focal variable for CG vs TG scores on Spelling post test scores, when using pre-test scores as a covariate

Experience teaching grade one learners in a local language (CG vs TG)

Moderation analyses with this variable produced significant results for two of the comparisons, CG vs TG and CG vs TIG. Linear model results presented in table 18 below are for the CG vs TG group.

TABLE 18 Linear model for experience teaching Grade one learners in a local language as a focal predictor of Spelling post test scores for CG vs TG group, with pre-test scores as a covariate

	B	SE B	t	p
Constant	2.58 [-1.55, 6.72]	2.06	1.26	p=.22
CGvsTG	5.04 [-1.61, 11.69]	3.31	1.52	p=.13
Experience teaching (local language)	-.09 [-.57, .38]	.24	-.40	p = 69
Interaction	-2.23 [-4.12, -.34]	.94	-2.38	p = .02
Base Spelling	.84 [.54, 1.14]	.15	5.57	p<.001

Note: R^2= .53

The results presented in the above table show an interaction between experience teaching first grade learners literacy in the local language and GraphoGame intervention b = -2.23, 95%, CI [-4.12, -.34], t = -2.37, p<.05. The regression slopes presented in figure 16 below indicated that in the TG group the less experience the teacher had teaching first grade learners literacy in the local language, the better the learners' model estimated post test scores on the Spelling. As the teaching experience in this group increased, the learners' post test scores reduced. For the CG the difference between the teachers' experience in the local language did not alter the estimated post-test scores.

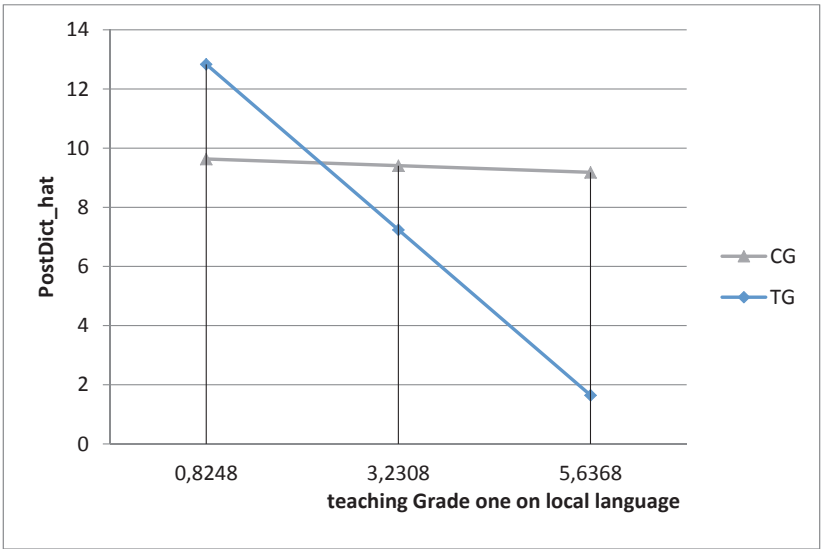

FIGURE 17 Represents simple slope equations of the regression using experience teaching first grade learners in the local language as the focal variable and CG vs TG scores on Spelling post test scores, when using pre-test scores as a covariate

Experience teaching first grade learners' literacy in the local language (CG vs TIG)

Moderation results for experience teaching first grade learners' literacy in the local for the CG vs TIG are presented in table 19 below.

TABLE 19 Linear model for experience teaching Grade one learners in a local language as a predictor of Spelling post test scores for CG vs TIG group, with pre-test scores as a covariate

	B	SE B	t	p
Constant	6.06 [-.92, 13.04]	3.43	1.76	p=.09
CG vs TIG	-4.11 [-9.45, 1.23]	2.63	-1.56	p=.13
Experience teaching (local language)	-2.15 [-3.82, -.48]	.82	-2.62	p = .013
Interaction	2.08 [.41, 3.76]	.82	2.52	p =.016
Base Spelling	.98 [.65, 1.32]	.17	5.93	p<.001

Note: R^2= .64

The above table shows that there is an interaction between experience teaching first grade learners literacy in the local language and the moderator (CG vs TIG) b = 2.08, 95%, CI [.41, 3.76], t = 2.52, p<.05. The regression slopes in figure 15 below indicate that in the TIG the less the teaching experience in the local language the teacher has, the greater the learner estimated post-test scores on the Spelling test. The post-test scores in this group reduced at the teacher's experience increases. This result is similar to the results obtained earlier when the same focal variable and different intervention group. In comparison to the CG vs TG results above, the CG vs TIG results have a much steeper slop. In the CG vs TIG group the estimated post test scores of learners with teachers who have a large amount of teaching experience in the local language are much lower than the CG vs TG. Figure 18 below presents these results.

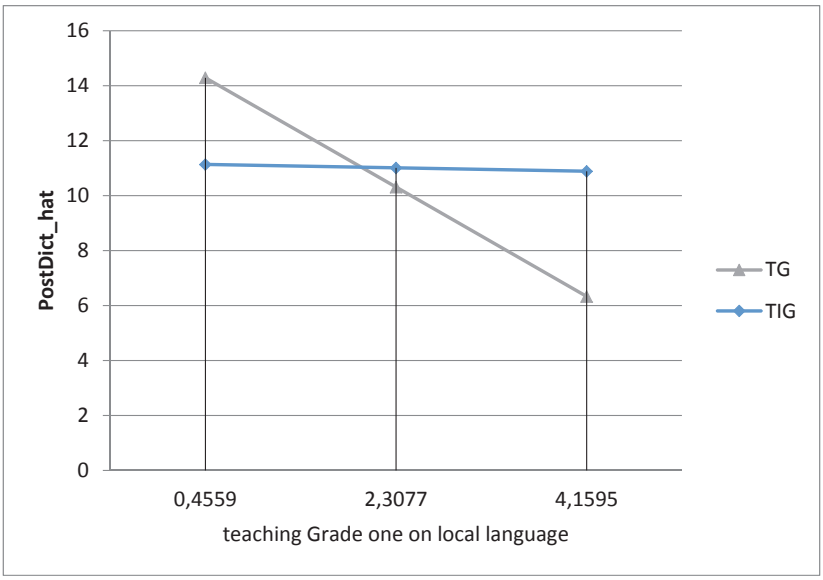

FIGURE 18 Represents simple slope equations of the regression using experience teaching first grade learners in the local language as the focal variable and CG vs TIG scores on Spelling post test scores, when using pre-test scores as the covariate

5.7 Qualitative results

Qualitative data was collected using focus group discussions. The main aim of using focus group discussions was to obtain in-depth information about the experiences and challenges of first grade Zambian teachers**.** It was hoped that this data would supplement the quantitative data collected in this study. Thematic analysis of the data was conducted for each of the questions that was asked. The results for this analysis are presented in the subsequent paragraphs.

5.7.1 Being a teacher

The first question the teachers were asked related to the teaching profession. The question was "What do you enjoy most about being a teacher?" The teachers gave an array of responses to this question. Many explained that they enjoyed the interaction with learners. They loved to teach. They enjoyed empowering their learners with the relevant skills needed to excel in life. They believe they are educators of the nation. Their learners become valuable citizens who take up different professions that help the development of the country. This makes them very proud to be teachers.

> "Society is nothing without teachers. Teachers produce manpower for the nation. As Grade one teachers we provide the important basic skills that children need to

> succeed in life. It makes us very proud as teachers when our children grow and are able to take care of themselves. Some become important people in society."

Some of the teachers mentioned that teaching for them comes naturally. They are born teachers. They are intrinsically motivated to teach even under difficult situations. Other mentioned that they exhibited leadership qualities when they interacted with their peers. They were always in control of the play activities, they stopped fights and the group always followed their instructions.

> "As a little girl, I was always in charge. Whether it was at Sunday school or playing with my friends. I would always lead my peers and give instructions on what games to play and how to go about playing these games. Everyone used to tell me from a very young age that because of these leadership qualities, I would become a teacher, which I did."

> "I knew from the time I was little that I would become a teacher. I am a born teacher. I am not a made teacher, teaching is what motivates me every day."

They explained that good teachers are difficult to find. They believe that some people become teachers because they have failed to pursue their desired careers. For those individuals, teaching is a last option. Those are the teachers that are not motivated to teach because they enjoy teaching. They need the money to survive. They believe that those teachers can be identified by their work ethics and lack of concern for their learners.

> "Some of these so called "teachers" do not like to teach. They just need the money to survive. You find that these are the ones that are always late for class. Sometimes they don't even show up. When they come to work, they just go through the teaching material without caring if their pupils have learned the concepts or not. After sometime you find that they leave the teaching profession and go and do something else. Others just come for a few months and make money to start a business. So not everyone can teach. Not every teacher is a good teacher. Some of these teachers feel trapped. They have not managed to succeed in doing the careers they wanted. They didn't do well at school so they only profession they could get into was teaching. Unfortunately, it's the pupils that suffer."

Other teachers believe that teaching is in their blood. They have other family members who are teachers. Some explained that either one or both their parents or caregivers were teachers. This motivated them to become teachers. Others mentioned that these were the role models they had in the home. They therefore found themselves taking the same path.

> "For me, my father was a headmaster and my mother was a teacher at the same school where I used to learn. As I was growing up, I developed interest in becoming a teacher myself. In those days teachers received a lot of respect and recognition, not the way it is nowadays. So because my parents were both teaching I ended up doing teaching. My two brothers are also teachers. It's like teaching is in our blood."

Based on the responses the teachers gave, the researcher asked the teachers what they thought their role as teachers was. From the responses provided, they saw their role as multifaceted. Many of the teachers expressed appreciation and genuine concern for their learners. They explained that many of their

learners come from disadvantaged home backgrounds with many different challenges. They mentioned that some learners are orphans and their caregivers just send them to school without any food, even when they are unwell, others come from abusive homes, where they are physically or emotionally abused by the parents or one parent is abused by the other, others have parents that are either drug addicts or alcoholics. They explained that this may not be the case for all the learners but there were certainly some who come from such backgrounds. As teachers they believe they are expected to educate these learners and also be their parents to help them through the challenges at home that will impact their concentration and academic performance.

Almost all the teachers mentioned that they enjoyed the respect and appreciation they received from their learners. They felt that the learners in the lower grades, for example, first graders, were more appreciative of their efforts. The teachers mentioned numerous ways in which their learners showed their appreciation. Some of these included the different ways in which learners made an effort to check up on them when they were unable to come to school especially if they live in the same neighbourhood, the ways in which they helped them carry books in the morning on their way, the efforts the learners made to greet them on their way to school. The teachers mentioned that they enjoyed the interactions they have with their learners. They developed a sense of pride in the learners when they grasped the concepts they were taught in school, when they learn to read and write, even their own names. As teachers, they felt a sense of achievement when they were able to make a difference in the lives of their learners by empowering them with various academic, social, emotional and psychological ways.

> "When these children come to school. We become not just their teachers, but their parents as well. We take care of the children, we don't just teach, the children confide in us when they have problems e.g. when one of my pupils was raped. We don't just teach them how to read and write. We mould them on how to associate with each other and older people in society. We teach them respect and good manners, we teach them how to live with other people. We teach them about going to church and praying. We teach them manners."

5.7.2 Challenges experienced by Grade one Zambian teachers

The first challenge discussed by the teachers was related to the NBTL. Teachers mentioned that it was too involving. There were (a) too many activities involved, which included dealing with the different individual ability groups in the teacher corner (b) the one hour allocated to the teaching of literacy using NBTL was inadequate. (c) Furthermore teaching and learning materials were inadequate. Many teachers complained that apart from the first NBTL teaching kits, which were given to them when NBTL was introduced, they had never received any other NBTL teaching and learning materials. Over the years, these kits have been used by many different teachers and have since either been lost or worn out.

> "One hour is not enough to teach NBTL you can even go for two hours. Just giving instructions for those in the independent groups is a lot of work, then dealing with the teaching corners it's too much, especially when you have a lot of children to deal with and you are expected to deliver quality education."

The second challenge discussed by the teachers related to the language of instruction. The teachers explained that use of ciCewa and not ciNyanja in teaching and learning literacy was difficult for teachers and learners. The teachers reported that this problem was worse for teachers and learners who were not conversant with ciNyanja.

> "Sometimes the teacher doesn't under the words. Sometimes I read a story and I don't understand the story. The ciNyanja used in the books is ciCewa. They need to simplify the language so that everyone can understand. The pupils are the ones who help us understand sometimes."

The third challenge related to the number of learners in a classroom. Teachers mentioned that the number of learners in the classroom affected how they taught and interacted with the learners. It was difficult for the teacher to know each learner well and interact with them meaningfully, apart from those who stood out because they were very active in class or mischievous. The teachers reported that the large number of learners compounded the problem of inadequate teaching and learning materials especially learner text-books.

> "The other challenge we find at our school is that the NBTL teacher wastes a lot of time trying to cover a particular section of the work in the NBTL lesson. Because of the numbers in the classrooms this can be very difficult because we need to cover so much within a short period of time. Others have also said having less books is also making it very difficult to teach and complete the course. Some classes have like 60 children."

The fourth challenge mentioned had to do with the age of learners. The teachers indicated that some learners come to school at age 5 instead of the age prescribed by the Ministry of Education, which is 7 years. The teachers noted that many of these children will not have attended pre-school. This lack of preschool experience means these learners need time to acclimatize to the school learning environment in comparison to older learners, who will have attended pre-school. Some teachers felt that as long as the learner had attended pre-school, they could still begin Grade one at the age of five. However, the majority of the teachers expressed the view that both age and pre-school exposure were essential prerequisites to Grade one schooling.

> "It is difficult to give instructions, some cannot follow they are too young. Their minds are focused on playing. It is difficult when they are just starting school. When they are at home, they are treated like children when they come to school they expect to be treated the same way. Some of them even sleep during the lessons. Those under 7 years are a problem."

> "Also, the age at which we enrol these pupils is important. You find that those who have been to nursery school by the time they are going to Grade one they will be much better at settling into class than those that go to Government schools and have never been to nursery. Even if the child is five, they can be ready for school. But those

> in Government schools, sometimes they bring them to school early and they have never been to nursery school. They have never been exposed to any kind of formal learning or whatever."

The fifth challenge concerned parental support. Teachers were visibly emotional about the lack of support from parents. They indicated that what they try and achieve with learners in the classroom is not continued when the learners go home. Teachers reported that many learners come to school without their homework done, without the necessary learning materials like pencils and books, which their parents are expected to buy for them. They further lamented that very few parents take the time to come for open day. This is a day scheduled for parents to meet with teachers, in order to discuss the general behaviour and academic progress of the learner. Teachers noted that absenteeism of learners can sometimes be attributed to parents who give their children household chores or vending activities that keep them away from school. Some parents ensure that their children attend school but with very poor physical appearance and low levels of hygiene. Some children attend classes with dirty uniforms and shoes and uncombed hair. Others come to school hungry, without any food to eat at break time.

> "Parents do not provide assistance of learning materials, when we give out pencils, rubber and books, parents keep them and ask the child to use one or two books for the different lessons. They always give excuses for not coming to school for parent-teacher meetings."

> "The challenge I have and this is very painful to me. Parents neglecting their children. When we ask them to come to the school to brief them about their child's class performance they do not come. Children come to school without jerseys and this is winter, no shoes and scruffy looking. When you ask the child they tell you that their parents were sleeping when they were coming to school. That is very sad. A child that age to be doing everything on their own while they are sleeping. I am looking forward to a generation where a maid can be a Grade 12 because some parents are not educated, they have such low expectations of their children. They don't come when you call them to check on their children's performance. Most of it is due to illiteracy."

> "The community is also not supportive, this issue of having free education the community has taken it to another level, when you tell them to buy their children pencils they tell you its free education so we shouldn't be buying anything. The government will buy books for the children."

Another challenge teachers experience is that parents do not support the policy that literacy should be taught in the local languages. Teachers noted that parents' perception of the NBTL was negative. This negative perception and lack of appreciation is exhibited by fellow teachers who are not first grade teachers. These teachers regard first grade teachers who use local languages to teach literacy as less prestigious than they are.

> "Parents are not very receptive to the idea of teaching in Nyanja, they do not understand the syllabus. They think that the work is repetition and that teachers are lazy. They do not understand why we teach in Nyanja. They need more sensitization."

Lack of incentives for first grade teachers was also cited as a challenge. The teachers felt that their role as first grade teachers involves more work than any other teacher. They noted that they form the foundation for learners to able to function in the school environment. Many of the learners that are enrolled have never been to pre-school. Teachers are expected to help these children adjust to this unfamiliar environment, teach them how to sit correctly at their desks, how to hold a pencil and how to read and write. These tasks were made difficult by teaching multiple grades and multiple first grade classes with large numbers of learners. They noted that teachers are generally demotivated when they are assigned first grade classes. This compromises the quality of their teaching. Based on this the first grade teachers felt that they should be given incentives in the form of additional allowances.

> "One teacher is expected to teach so many classes. Employ more teachers. Teachers are tired, especially in high density areas."

> "We are not motivated. We are really discouraged when you are given Grade one. There are ways in which we cut methods we use short methods so for example instead of introducing the sentence to one group at a time, I teach the sentence to the whole class. Even our administrators they don't push our papers for payment for double class. Teaching for 5 years I got nothing out of teaching NBTL. We have a short cut for everything. To be frank."

5.7.3 Reasons for poor performance in reading

The teachers were asked what their views were about the consistent research findings that Zambian learners perform poorly in reading. The following are the reasons presented by the teachers.

The lack of adequate learning and teaching materials was cited as one of the reasons for the poor performance of the learners. This was mentioned in relation to the NBTL. Since the first batch of teaching and learning materials that Government presented when it first introduced the curriculum, it has never replenished these materials. Teachers complained that they had to use their initiatives to replace the teaching materials that were either worn out or missing from the NBTL kits. They also noted that schools inspectors sent by the Ministry of Education have themselves expressed ignorance about the NBTL.

> "I also want to conquer with my colleagues when the government comes up with a new programme they support it only for one or two years. After this they do not give the support, like training or replacing the materials. Sometimes it is the Government which is making the children not perform the way they are supposed to perform. They are not supporting us. In some schools the NBTL is non-existent. It has died a natural death. When you ask them about NBTL they just say "*sitiviziba ivo*" [we don't know about that]. Some of the heads don't know. Once I was visited by a DESO who was not familiar with the NBTL. It's unfortunate that even the top people there don't know about NBTL."

The teachers also attributed the poor performance of learners in reading to insufficient time assignment for teaching literacy. They explained that one hour alone was not enough time to get through all the teaching activities allocated in

the NBTL curriculum. They indicated that they try and manage this time limitation by omitting some prescribed literacy activities.

> "Time is not adequate, we need more time for NBTL one hour is not enough. Grade ones are babies, to make them into something, into a real human being it takes a long time."

The challenge mentioned earlier of having too many learners was also highlighted as a factor contributing to the poor performance of learners. The teachers explained that when there are too many learners, it is difficult for them to teach. It is also difficult for them to ensure that every learner has grasped the concepts that have been taught. They mentioned that even just trying to get them to settle down for a lesson can be quite challenging.

> "One of the biggest issues is that of enrolment. You find that a teacher has so many children to deal with. Because of this they spend a lot of time trying to make the many children they are teaching grasp what they are being taught and this takes up a lot of time."

> "Too many pupils in one class 64, 80 children makes it difficult to teach. Makes it difficult to provide attention and quality education. Difficult to mark and ensure that children conduct all the corrections to their work."

The above point is connected to the issue of infrastructure. Some teachers explained that the reason they have large numbers of learners also has to do with the lack of infrastructure. They explained that in some of their schools, there are only two Grade one classrooms, with four or six streams of Grade one classes. This means that enrolled learners have to fit into these streams. It also means that they have to share these two classrooms throughout the day. In order to do this each class will be allocated a specific number of hours within which to use the classroom. On average the classes are given between 2-3 hours after which the next class will need to use the classroom. This has led to teachers teaching multiple Grade one classes in a day. These double and sometimes triple shifts affect the quality of teaching. The longer the teaching hours, the more tired the teacher becomes thereby reducing on the quality and quantity of work they produce.

> "Government needs to increase infrastructure in existing schools instead of rushing the built more schools. When some of our schools were built, there were very few pupils. Now there is demand for education and the numbers have drastically increased. If they increase the infrastructure it will mean that this business of working double shifts will be reduced. It is very tiring for us when we work double shifts. What is worse is that some of Heads don't even push for us to get allowances for these double shifts."

Another factor contributing to poor performance of learners in reading is absenteeism. The teachers noted that most of their learners are frequently absent from school. In a week a learner can be absent 2 or 3 days of the week. Therefore the learner misses out on important lessons, which affects their performance.

> "Like at our school, absenteeism is quite high. Parents and children give all sorts of excuses. Pupils will say no I had to go and fetch water, sometimes it's…. no…my uniform was dirty. Sometimes they have no genuine reason at all. So for me this problem of absenteeism really is also encouraged by the parents. They don't guide their children. They have the responsibility to make sure that the child comes to school. The responsibility doesn't just lie with the child him or herself."

Teachers cited the lack of motivation and support from MOE and school administration as another reason that is contributing to the poor performance of learners. They explained that as long as teachers felt that they were not being supported and recognized for their efforts, the quality of teaching was likely to be affected. Some teachers noted that within their schools, the teaching requirements of first grade teachers are given last priority. They were always purchased last and are sometimes not purchased because they are deemed as unimportant. With regard to the Ministry, the teachers felt that they were not compensated adequately for the amount of work that is involved when preparing lessons and teaching first graders.

> "The other thing I wanted to say is that we are not motivated to use the NBTL. You know that NBTL requires a lot of work. Even if you spend a lot of time preparing, you work hard and then, at the end of the day, you just come out just like that, without the pupils breaking through, and people don't appreciate your efforts. Like, when I started, we were given some sort of incentives when it first started, the incentives just died a natural death. So you find that even the time you spend using it, we are not motivated."

Teachers also complained about Government's introduction of the literacy policy and curriculum in education without soliciting input from the teachers. The teachers felt that they have a lot to offer because of the insights and experiences they have gained through implementing policy and curriculum as well as interactions with the learners. They believe that based on their teaching knowledge and experiences, they have vital information about teaching that should be considered in the formulation of policy direction or curriculum. The teachers believe that their rights as teachers need to realized and respected if they are to be motivated and committed to Government's vision for quality education.

5.7.4 Effectiveness of the NBTL

In an attempt to discover the teachers' view on of the NBTL, the teachers were asked to explain what they thought about the effectiveness of NBTL.

All the teachers agreed that NBTL curriculum can be used to teach reading skills effectively. The teachers gave various reasons why they thought NBTL was effective in imparting literacy skills. One of the reasons they gave was that local language was used as a medium of instruction for literacy. They explained that this was very important for learners because for most children, ciNyanja was the language of play. This made it easier for them to learn to read.

> "Using the local language to teach children how to read is a good idea. Most of the children we teach come from homes where they only speak local languages. So …like

> in Lusaka most children know how to speak ciNyanja by the time they are getting into Grade one. They are already familiar with it because they can speak it and understand it. When they come to class, we just teach them how to read it."

Other teachers explained that NBTL was good for teaching literacy although it was more appropriate for teachers and learners in the Eastern province of Zambia. They explained that because ciCewa was used in the syllabus, it was easier for teachers and learners who spoke it to effectively use it.

> "The NBTL works very well, especially for those who understand the language like those in Chipata who learn in ciCewa. It's just that in Lusaka the language is different a bit because we speak ciNyanja but are supposed to teach in ciCewa. Somehow we are managing."

Some teachers mentioned that they appreciated the way in which NBTL was structured. They believed that the structure was organised in a way that made it easier for the teacher to introduce basic information about reading and writing. NBTL provided important information such as how to hold a pencil, how the child should sit and how the children should handle their books. Information on how to teach is introduced in steps or stages that both the teacher and learner are able to understand.

> "The pacing in NBTL is good. It uses the local language which learners can understand, it uses syllables which make it easier to teach them how to read, the teaching is organised in stages making it helpful for both the learners and the teachers; it teaches the learners about posture and how to sit when writing and also how to hold a pencil."

Some teachers stated that they appreciated the NBTL because it challenged them to think as they are planning their lessons. This was mentioned in line with classroom activities and materials needed for these activities.

> "… NBTL unlike the older method, is very good, it encourages the teacher to think when planning the lessons. Sometimes the teacher has to bring certain materials from home in order to make the pupils understand the lesson and also to make teaching exciting. For me the training was very nice: I did it in college, we learned a lot. We were given the kit we needed and we implemented in the school."

Other teachers explained that they were in support of the NBTL because most of their learners were able to break through and once this happened the learners had no problems reading and writing in the subsequent grades. This was true especially in the beginning when it was introduced.

> "The NBTL is very effective. When the programme was very well funded just when it was introduced, the children were breaking through. After a year or two the letters got spoiled and teaching became more difficult."

Other teachers explained that they appreciated the way in which NBTL used the phonemic approach to introduce basic reading skills. This was done by first introducing the sounds of the letter, then syllables. Syllables were then combined to form words.

> "The way in which the information on how to teach pupils to read is very easier to follow and it is very effective. First you introduce the letter sounds. We usually start with vowels like a, e, i, o, u. Once the children learn the vowels, we introduce the consonants. We then combine these vowels and consonants to form syllables. After syllables we teach them how to make short words, then long words and then sentences. Most of the time they are able to follow. So this method is easier, children learn to read faster than those days when pupils used to memorize words."

Challenges experienced with NBTL

Teachers were then asked to explain the challenges they were experiencing in the implementation of NBTL. Below are the various explanations they gave.

The first point they mentioned was that they were expected to teach effectively with incomplete NBTL kits. Many of them explained that they were expected to teach literacy effectively with incomplete NBTL kits. They further explained that they had only received NBTL kits once. This was when the programme was first introduced in the curriculum. They had never received anything else since. They further explained that learners needed more than one exercise book. However, this was very difficult for parents to understand. They believe that learners should only have one book for one subject.

> "When NBTL started it was very good: the children were breaking through; almost half the class was able to read. But now, because of this issue of books and the kit, it has become a problem. The issue of exercise books for the pupils is also a problem. When you tell them to come with books they say *ciNyanja mulemba cimodzi niyaciani mabuku abili [you write the same ciNyanja, why you need two books]*. They don't understand. They expect their children to use one book as long as they are writing ciNyanja."

With regard to the NBTL kit, teachers explained that they had to use their own initiative in order to effectively use the kit because it was old and many sections were either torn or completely missing from the kit.

> "Even those charts, I use my own initiative, most of those sounds and letters are missing. I just use my experience, with the chart the first 10 pictures are not there. I just use my experience. We do not have the kit. I don't know whether they stopped funding the NBTL. We don't know. Even those sentence makers we don't have."

A recurring theme in the discussion had to do with the number of learners. Teachers explained that the large number of learners made it difficult for them to apply some of the important principles emphasised in the NBTL effectively. One of these principles includes dividing the class into ability groups. Teachers indicated that in order to conduct exercises in these groups effectively, they should consist of no more than 10 learners. Unfortunately, most of the groups consist of 20 learners or more.

> "When you mix them, it becomes a problem because this one is faster than the friend. If you group them into ability groups, it will be easier to find interventions for that group because they have almost the same ability. When the groups are mixed, it becomes tiring and cumbersome to deal with these groups. But if they are divided according to the abilities it becomes easier to come up with activities according to what the individuals in the group are able to do. But if they are mixed, this one will

> be able to read and then this one is not reading. So already they will remain behind. We are also talking about time limits, trying to manage time within these groups. So even for ability groups, they can be difficult to manage if they are too many, which is the problem some of us face."

Regardless of the large number of learners, some teachers were in support of pacing the learners.

> "I think that pacing is a good idea because you see that as our children improve, you know that this is where I am going to focus my attention. Usually we do not focus on the intelligent ones who are doing better so if you mix them it will consume much of your time. What time are you going to have to concentrate on the slower ones? The good thing about pacing is that those that are already intelligent you will just say these I will give them work to do and they will manage to do it on their own. It is also going to motivate those ones who are slow also to work hard and be in that group as well. At the end of the day you have half of the class that has broken through."

Another important component of NBTL, which teachers thought was tedious to implement was the Taonga market component. According to the teachers, they could not understand the significance of listening and using the Taonga market radio programme for teaching purposes. They noted it was quite tedious to implement this segment of NBTL because the learners would make noise instead of listening to the programme. These sentiments were expressed by the teachers who had a radio to use for this purpose. More than half of the teachers indicated that they did not have radios to use for Taonga market. For this reason, they had completely excluded it as a teaching activity.

> "Another thing I forgot is this Taonga market. I don't understand why the Government accepts every programme that comes their way. We should be careful and we should be refusing some of these things. What is the difference between Taonga market and NBTL? In NBTL they say "ambuya" in Tonga they say "agogoakadzi"… the only difference is that it's confusing and time consuming…..I don't like it."

The point mentioned above is also linked to the negative perception and negative attitude that parents have towards NBTL. Parents consider English to be the language of success. Teachers explained that the parents believe that their children come to school to learn to read and write in English. This is what will increase their chances of getting meaningful employment when they leave school. Based on this perspective, parents question their children being taught in the local language when they send them to school to learn English. The teachers explained that the parents do not understand the reasoning behind the use of local language in teaching literacy.

> "Parents are not very receptive to the idea of teachers teaching in ciNyanja, they do not understand the syllabus. They think that the work is repetition and that teachers are lazy. They do not understand why we teach in Nyanja. They want their children to learn to read and write in English. According them, that is why they send them school. So that they can learn to read and write in English, which will help them get good jobs after school. They need more sensitization."

A major challenge expressed by the teachers in relation to NBTL is inadequate time to implement all the stipulated activities within one hour. Some of the teachers mentioned that because of this, they tend to leave out certain activities. They teach what they feel is important.

> "One hour is not enough to teach NBTL you can even go on for two hours. Just giving instructions for those in the independent groups is a lot of work, then dealing with the teaching corners… it's too much, especially when you have a lot of children to deal with and you are expected to deliver quality education. I don't do everything I am expected to do in the NBTL because of this. I either teach everything or risk not finishing the syllabus or I teach some things and leave out others so that by the end of the term, everything is done."

Another challenge the teachers highlighted had to do with the kind of support they received from the administration as first grade teachers. They lamented that their administrations did not care whether or not they had adequate teaching and learning materials. They were just expected to teach regardless. When they requested for materials they were always told there were no financial resources and yet resources were available for requests by other grade teachers. They teachers expressed sadness that many of the teachers did not understand the NBTL and the significance of teaching literacy in local language. They were held in very low regard by their fellow teachers. In some instances, their fellow teachers have been known to downplay the importance of learning literacy in the local language to parents. This contributes to the negative attitude that parents already have about NBTL.

> "Not all the teachers understand NBTL. They talk about it negatively to the parents. Teachers think we are dull, and that we didn't do well at school that is why we are teaching Grade ones in ciNyanja. They look down on Grade 1 teachers. Our fellow teachers betray us. They think we over emphasize the teaching of Nyanja. They call us Taongas….from the Taonga market in NBTL."

Many of the teachers expressed the need for refresher courses/training in NBTL. Some of the teachers mentioned that since the training they received when NBTL was introduced they have never received any other NBTL training. They believed that it was important to constantly receive updated information even if the teachers had already been trained. Refresher courses in using NBTL would be helpful for them, especially since most of them had not been fully implementing the NBTL due to incomplete kits. Some expressed the view that in-service training in general needed to be conducted more regularly for the first grade teachers.

> "I think that the Ministry of Education should do a better job of in-service training and on allocating the teachers to Grade one classrooms. All those teachers who teach Grade one should have in-service training every two years or so. In our schools you find that someone has never ever experienced NBTL but she'll be put *ku*Grade one [in Grade one] to contribute to NBTL. So it's better they increase in-service training, even at zonal level we will appreciate. Every year, they get Grade one teachers for training, just as a refresher course. The Ministry does have trainings but most of the time it's just for a few hours. What can a teacher learn in 3 hours? They are not

> effective, so we need in-service training. They go for workshops that take days and yet they cannot sacrifice to train the teachers."

Another challenge experienced by the teachers relates to the language used in NBTL. The lingua franca in Lusaka district where this study was conducted in ciNyanja. The language of instruction used in the NBTL is ciCewa. The latter is more familiar with the people that live in Chipata and not those that live in Lusaka. The teachers explained that while there are some similarities between these two languages, there are also very stark differences, which made it difficult to use when teaching Lusaka learners. The teachers themselves confessed that they did not understand some of the concepts used in the teacher and pupil books. They had to inquire from their fellow teachers. This situation was worse for teachers who are not ciNyanja speakers and were trained to use NBTL in a local language other than ciNyanja.

> "Sometimes even the kind of ciNyanja that is in the books is difficult for the pupils. The ciNyanja in Lusaka is a mixture of languages so some words are in English and some of the words in ciNyanja. When they do not understand, it is just the pictures in the text book that help them understand. It is difficult. The pictures help them know what you are talking about. My strategy is to just tell them what they know even <if>it's in English. Even for us teachers, understanding some words used in the books can be difficult. We just try and ask other teachers from other grades what some of the words mean. Sometimes even the pupils themselves are the ones that help us. It can be very difficult especially for a teacher who is from another province."

Suggested changes to the NBTL

Based on the above listed challenges, the researcher proceeded to ask the teachers what changes they suggested should be made to NBTL, if given an opportunity by the Ministry. The suggestions that were made were corresponding to the challenges they had mentioned. The first change was the language used in NBTL from ciCewa to ciNyanja.

> "The methodology is fine. It just the aspect of the language. Even the same ciNyanja that we use in NBTL is different from the one the children know and speak at home. So the ideal thing with the NBTL would be to look at this situation of the language. Yes it's ciNyanja but the ciNyanja that this child knows is different from the ciNyanja that this child has come to learn in the classroom. So it's like the child is still learning a different language, which is difficult for them. For example, you show them a picture of a dog, the children know it as "*imbwa*" and yet in the book it's "galu". So at school they learn it as "galu", when they go back home, they are still using "imbwa". So I think that the language should change into a language that they use which is the ciNyanja that is spoken within the community."

The suggestion was related to the amount of time allocated to teach NBTL. The teachers suggested that this time should be increased. There was consensus within the various discussion groups that it should be increased from one to two hours. Teachers felt that this would help reduce the pressure they constantly under to complete their teaching. Increased time would make it easier for them to conduct most of the activities suggested in the teacher handbook. It would also help them complete the syllabus by the end of the

academic year. In line with NBTL the teachers also suggested that there should be increased funding to the NBTL curriculum in order to ensure the continued production of the kit. Each primary school should be given a new kit every year.

> "The amount of time for teaching literacy needs to be increased. We have always been complaining about this and yet nobody listens to us. Including those same inspectors that come to our schools. We have suggested that the time should be increased from one hour to at least two hours. This will make it easier for us to carry out some of the tasks that have been mentioned in the book and not skip some of them as we are doing at the moment. It will also help us complete the syllabus on time."

The issue of increased remuneration for first grade teachers was also mentioned. The teachers stated that they would suggest an increase to the allowances of first grade teachers. They felt that they do a lot more work than teachers from other grades. They help learners who have never been exposed to the school environment adapt and form foundations for future learning. Teachers in other grades build on the work they do. They also suggested eliminating Taonga market. Teachers had indicated earlier that they thought it was tedious. In some cases, teachers did not have radios to use as this is a radio programme, which they are expected to use for teaching.

> "Teachers of Grade one need to get more money because it's just not academic work that we give to the children it's a lot of other things. I think we need to be appreciated more, there should be an allowance to ensure that the teachers are committed. Grade one teachers put in a lot more than most teachers from other grades e.g. mark books, prepare for tomorrow, discipline, helping them adapt to the school environment. There should be an extra allowance for teaching Grade ones."

> "Government should increase funding to the PRP. They should not start something and then be unable to finish. Let them continue production of the kits instead of expecting the schools to buy their own kits when they do not give them enough money to do this. Having those NBTL kits will really help our teaching."

> "That Taonga market should be scrapped off. We have no time to use it. There are too many learners for them to follow. In any case, there isn't enough time to use it during literacy hour. Some of us don't even have the radios to listen to the programme. They should just remove it. It is cumbersome."

One of the other suggestions that was made by the teachers was the need to sensitize parents about the use of local language in Grade one. The teachers believed that if this was properly done, parents would become more supportive of the programme. Two teachers explained that their head teachers have had several meetings with parents about the importance of using NBTL to teach literacy. They teachers explained that meetings help the parents understand how they can help their child to learn. The teachers had observed that parents had become more supportive and more involved in their children's school. The other teachers explained that they had experienced challenges just getting parents to attend meeting. They suggested that Government needed to spearhead the sensitization process. They believed that parents were likely to be

more co-operative if the message came from Government and not teachers in schools.

> "There is need for Government to do more sensitization. In fact it is Government that should spearhead this process. It should not be left to the teachers and the heads of schools. We really need their support if we are to succeed in teaching their children successfully. We need to work together with them. Most of them do not attend meetings they are invited to, even open day meetings to discuss the progress of their own children. So Government should have radio and television programmes that will sensitize the parents about their role in the school."

Another suggestion the teachers made was related to their deployment after completing teacher training. The teachers explained that after training teachers are deployed to teach in different parts of the country. There is need to ensure that first grade teachers are deployed to parts of the country where they are familiar with the local language. They explained that some teachers are not effective because they are expected to impart literacy skills to first grade learners in a language that they do not understand.

> "Government really needs to take this deploy issue very seriously. When sending teachers to teach in different parts of the country after they have completed their teacher training, they should ensure that the teachers are sent to areas where they understand the local language in that area. We are not like the other teachers who teach in English. We teach children to read in the local languages therefore we need to be sent to places where we understand the language. If I am Lozi and they send me to Chipata when I don't know how to speak ciNyanja or ciCewa, how do they expect me teach the children to read and write in ciCewa or ciNyanja?

6 DISCUSSION OF FINDINGS

6.1 General characteristics of first grade teachers

The current study focused on general teacher characteristics that included demographic information such as age, mother tongue, teacher qualifications, PRP training, general teaching experience, experience teaching first grade learners and experience teaching literacy in the local language. Information about the number of classes they teach and the number of learners in these classes was also collected as part of the general characteristics.

6.1.1 Age

The age of the teachers in the current study varied between 24 and 54 years of age. The average age was 38 years. This average is also the average for grade 6 teachers in the region (SACMEQ, 2011). The SACMEQ report indicated that Zambian teachers were younger than teachers from Mauritius. The SACMEQ study also found that most of the teachers were female, which was also observed in this study. The teachers in the schools that were visited in the current study were female, except for one male teacher. In relation to this point, the report states that research findings have indicated that learners perform better when taught by female teachers than male teachers at grade 6 level. Some theories of motivation contend that there are more female teachers than there are male teachers because females experience a sense of control and authority when they are with learners. This motivates them intrinsically and makes them good teachers (Kobus, 2009). The majority of teachers in the current study were below 38 years of age. The issue of age is one that has not received much attention in Zambia.

As long as an individual is a qualified teacher, he or she is likely to find employment in the teaching profession. Although the retirement age of teachers in Zambia currently stands at 55 years of age, teachers generally tend to teach until a more advanced age. Various arguments arise as to the advantages and disadvantages of having younger or older teachers. Some argue that although

young teachers lack teaching experience, they have more energy, are more innovative and open to new experiences. Preference for older teachers is based on their teaching experience and the extensive knowledge and skills that come with this experience. It can be argued that older teachers have less energy, are less innovative and are likely to be monotonous in their teaching and less open to new ideas. Whatever the case, knowledge about the age of teachers is important because it could determine the choices teachers make in the classroom. In relation to this study, these choices could include the choice of teaching approaches, personal theories of teaching, opinions about the curriculum and motivation. The age of teachers could impact learning outcomes.

However, this study established that the age did not interact significantly with baseline scores on the orthography tests or the Spelling test. This finding suggests that in this study, the age of the teachers did not impact the literacy acquisition of learners. Further research may need to be conducted with a more diverse sample of teachers, including male teachers, to either support or dispute this finding. Findings of such a research would be valuable information for Government as they recruit and deploy teachers to teach various grades around the country. The following paragraphs will consider the study's findings concerning various specific features of the teachers' characteristics that are relevant to their preparation for teaching initial literacy to first grade learners.

6.1.2 Mother tongue

Knowledge of the teachers' mother tongue in the current study was important because literacy is taught in one of seven local languages. Therefore teachers would find it easier to teach literacy in their mother tongue than they would if they used another local language. Lusaka uses ciNyanja as the language of instruction. It would therefore be expected that the majority of first grade teachers would have ciNyanja as their mother tongue. In this study, only 12% of the teachers had ciNyanja as their mother tongue. The largest percentage were iciBemba-speakers, followed by ciNyanja, siLozi and lastly iciTonga. By virtue of teaching in Lusaka, these teachers are expected to teach literacy in ciNyanja, even if it is not their mother tongue. Data from the focus group discussion and responses from the Likert scale in the literacy curriculum domain reveal that the teachers believe that it is difficult for a teacher whose mother tongue is not ciNyanja to teach in ciNyanja. Since most of the teachers are not ciNyanja speakers, one cannot help but wonder what implications this could have on the literacy acquisition of the learners. What compounds the problem further is that it is not ciNyanja that is used in the curriculum, it is ciCewa. Although some similarities exist between ciNyanja and ciCewa, some major differences also exist. Explanations by the teachers about the difficulties of teaching in a language that is not their mother tongue, obtained from the focus group discussions received no confirmation from a rigorous empirical investigation of actual learner outcomes in this study. A possible explanation for this finding is that all the Zambian languages are Bantu. This makes them very similar

because they all draw from a Bantu phonemic system, therefore the sounds of the different languages are similar (Banda, 2002). The only difference can be observed in the spelling conventions, which reflect the spelling conventions of different missionaries who transcribed these languages to writing, rather than endemic phonemic differences in the languages (Banda, 2002).

The major challenge with the language of instruction is the use of ciCewa and not ciNyanja. The two languages are very similar. However, the CiNyanja referred to by the teachers is the lingua franca used in Lusaka and is often referred to as "town Nyanja". The teachers highlighted the discrepancy between the two languages during the focus group discussion. They explained that ciCewa was difficult even for the ciNyanja speakers whether they are learners or teachers. They further explained that it is difficult and confusing for the learners because some items they know in ciNyanja have different names in ciCewa. For example, in ciNyanja the word for dog is imbwa, in ciCewa it is galu. The benefits of teaching Zambian children to read in the local languages cannot be denied. However, a study conducted by Tambulukani and Bus (2012) revealed that children in Lusaka were not familiar with the language in which they were being taught to read in (ciCewa). They preferred to use words in "town Nyanja", which they commonly speak at home and at play. This discrepancy could be hampering the learning and teaching process.

6.1.3 Teacher qualifications

Research has established that one of the most important factors influencing student learning is the teacher. The influence of teacher qualifications on learning achievement has produced varied results. While some studies have established that teachers' educational qualifications are a prime predictor of students' performance (Adeyemi, 2010), other studies have found no significant relationship (Ravkin et al., 2005). Results from the study conducted by Zuzovsky (2003) revealed no significant relationship between teacher variables such as teaching experience and training in subject-matter and learning achievement. Regardless of whether or not a significant relationship is established, there is no doubt that qualifications are a formal indication of the kind of content knowledge an individual possesses. Qualifications are not necessarily an established indicator of quality or quantity of teacher knowledge. In this study, the majority of teachers (61%) had a primary teacher certificate as the only teaching qualification. This qualification is obtained in a much shorter period of training time than a degree (about one year). While it is a useful basic teacher qualification, it may not adequately equip first grade teachers with the necessary skills and knowledge to teach young children, some of whom have never been to nursery school, to read and write. The kind of knowledge required of a teacher who is expected to teach first grade learners literacy includes teaching methodologies appropriate for that age, knowledge on child development, knowledge on how to teach literacy, etc. Teachers are unlikely to be sufficiently trained with all this information within a period of twelve months. Similar to the findings of Ravkin et al. (2005) there was no significant

relationship between teacher qualification and literacy acquisition in this study. There was very little variation in the teachers' qualifications.

6.1.4 PRP Training

The three PRP courses (NBTL, SITE and ROC) are more specific to the subject matter of literacy. Knowledge obtained from these courses was very specific to literacy teaching as it relates to various grades at which the knowledge would be used (grades 1, 2 and 3 respectively). Several studies have found opposing results regarding the relationship between subject matter and student achievement. Some studies have shown a positive relationship between teachers' preparation of the subject matter and student achievement (Darling-Hammond, 2000; Goldhaber & Brewer, 2000). Other studies have observed a positive effect for some subjects but not others (Goldhaber & Brewer, 2000; Monk & King, 1994). In the current study more teachers were trained in NBTL than any of the other PRP components. NBTL contains subject matter content specific for teaching literacy to Grade one learners.

In this study, completion by the teacher of relevant formal PRP training was not a predictor of literacy acquisition by first grade learners. This finding is not unique, as established by previous research (Zuzovsky, 2003). An important point to take cognizance of is the duration of training for these courses. The data in the current study revealed that 5 days was the maximum number of days that teachers received in-service training in these courses, the average was 3 days. It is possible that this training time was inadequate to sufficiently prepare the teachers to teach literacy in the local languages. The various changes that have occurred with the literacy teaching curriculum, for example the change from teaching in English to local languages, means that teachers need more training time to ensure that they are well prepared to teach first grade learners in the local language.

6.1.5 Teaching experience

Experience is highly valued in all professions. A more experienced employee is believed to bring more value to the job than one who does not have experience. In the current study it was important to know the teaching experience of the teachers especially as it relates to teaching first graders in the local language. Primary teachers in most Zambian schools are not restricted to teaching one particular grade. Every year most teachers are given new grades to teach. This is to ensure that primary school teachers attain experience teaching more than one grade level. The only exception is the examination classes which usually have specific teachers specialised to teach and prepare grade seven learners for examinations. Grades 1-3 under the PRP and more recently grades 1-4 under the PLP are also special in that they have a specific curriculum that emphasises literacy skills in the local language. Teachers need to be trained in the curriculum in order to teach these classes literacy. Therefore the teachers' experience with these classes is important because the more experience they

have the more comfortable and competent they are likely to be in executing the prescribed instructional practices. The various changes that have taken place with the curriculum over the past two decades from teaching literacy in English to teaching in the local languages are likely to have different effects on different teachers, depending on which curriculum was in use when they were trained to teach literacy to first graders.

The results on teaching experience reveal that the largest proportion of teachers in this sample were between the ages of 30 and 40 years with between 3 and 10 years teaching experience. The results also revealed that the largest proportion of teachers (35%) had only 2 years' experience teaching first grade learners. With regard to teaching literacy in the local language, the largest percentage of teachers had 2 years' experience teaching literacy in the local language. These results show that the majority of teachers in this sample had a few years' experience as first grade teachers (five and less). This finding is very important because it shows that although there was a wide range in the age of the teachers, most of them were in their mid to early thirties, with only a few years of teaching literacy to Grade one learners in the local language. Only 8 % of teachers of 40 and 50 years of age had between 7 and 10 years' experience teaching literacy in the local language. By virtue of their teaching experience, the older teachers are more likely to have had more experience teaching other grade levels. They are also more likely to have been trained to teach using the old syllabus, which emphasised that literacy should be taught in English.

The fact that the older teachers were initially trained to teach literacy in English is likely to have influence their attitudes and beliefs towards the use of local languages, which in turn would influence how well they implement the curriculum in the classroom. Another source of variance with regard to teacher training in the local language could be related to the trainers. It is possible that over the years, the trainers of PRP have gained more experience and perfected their knowledge and training skills based on their interaction with various teachers. Additionally, they may have learnt from their previous experiences and challenges and have become better trainers over the years. Therefore, teachers recently trained are more likely to have obtained better training than those who were trained immediately after the PRP was introduced. Moderation analyses first conducted to determine whether teaching experience would moderate learner pre-test and post-test scores did not produce significant results. However and moderating effect was found when the teacher variable was used as a focal predictor, the GraphoGame intervention as a moderator and learner pre-test scores as a covariate. These findings will be discussed in detail under the GraphoGame section.

Correlation results for teacher characteristics revealed a strong positive interrelation between the age of the teachers and the teaching experience and experience teaching in the local languages with experience teaching Grade 1 learners. As the age of the teachers increased so did their teaching experience. Likewise, local language teaching increased as the experience in Grade 1 learners increased because the literacy curriculum in Grade one emphasises the

use of the local language to teach literacy. Much weaker correlations were observed interrelations between number of classes taught and number of learners. Teachers will have more learners by virtue of teaching more Grade 1 classes. In this study some the teachers reported teaching a maximum number of two classes, with an average number of about 50 learners. The interrelation between age and experience teaching Grade one was also low as age with experience teaching in the local languages. These results indicate that as the age of the teacher increased so did their experience teaching first grade learners in the local language. All the results around the teaching experience variables in this study revealed a positive relation with age and each other, with only two strong correlations out of the observed seven.

6.2 Teacher beliefs

6.2.1 Motivation beliefs

Teacher responses to the motivation sub-scale revealed that Zambian first grade teachers are more intrinsically than extrinsically motivated. All the teachers indicated that they are motivated when they their learners acquire the knowledge they teach. Responses given by the teachers to the open ended questions revealed a similar result. Sixty eight percent of the teachers explained that they were motivated when their learners acquired the knowledge they were imparting. This finding is in line with that of other studies (Kobus, 2009; Marston, 2010; Nkechi, 2012, Yong, 1999;). In the current study (87%) percent of the teachers indicated that they felt partly responsible for the education of the children they teach. This denotes a personal responsibility that teachers feel they have for the education of their learners. This kind of responsibility is associated with intrinsic motivation. Fifty-seven percent of these teachers set tougher standards for themselves than their heads do for them. This is another indication of intrinsic motivation. Responses from the teachers indicated that they were more intrinsically than they were extrinsically motivated although the question on whether they thought they were being paid enough for the amount of work they do as first grade teachers yielded a negative response.

The majority of the teachers in the current study believe that their salaries are inadequate (extrinsic motivation). The issue of inadequate salaries is not new to Zambia or other African countries. Teachers are constantly campaigning for increased salaries and better working conditions. Yet, amidst this dissatisfaction, teachers are still intrinsically motivated to teach. This finding highlights the power of intrinsic motivation to continue motivating teachers to teach even when they are facing challenges, a finding also confirmed by other studies (Davidson, 2007; Kobus, 2009; Nkechi, 2012; Sinclair, 2008; Yong, 1999). Teacher intrinsic motivation receives secondary attention from Government and teacher unions. Discussions related to teacher motivation are always focused on the extrinsic component. Suggestions for improving the wellbeing of

teachers are always framed with reference to factors such as salaries, housing and loan facilities.

While research acknowledges that these extrinsic factors are important motivating factors it also acknowledges the important role that intrinsic motivation plays in the teaching process (Kobus, 2009). The teachers in this study, like many other Zambian teachers, have to contend with various challenges such as inadequate teaching and learning materials, teaching multiple first grade classrooms, large classes (an average of 50 learners in each class), poor contact hours with learners and for some teachers, personal challenges outside the learning environment. It is therefore encouraging to note that amidst all these challenges, the teachers are intrinsically motivated to teach. Moderation results did not produce significant results. In the present study motivation, whether intrinsic or extrinsic, did not impact literacy acquisition of learners. There is need to conduct further research on the impact of teacher motivation on learning outcomes.

6.2.2 Beliefs about teaching approaches

Results from the teaching approaches domain reveal that teachers predominantly believe in the learner centred approach more than they do the teacher centred approach. Data collected from the open ended questions support this finding. This result is encouraging because literature has shown that teachers who use the learner centred approach have learners who perform better than those from classrooms with teacher centred approaches (Kangáhi, Indoshi, Okwach and Oscoda (2012); Marcon, 1999; Stipek et al, 1995). It is important to note that teacher beliefs were divided on the question that related to who was more important in the teaching process; the learner or the teacher. This disparity is also observed from the responses the teachers gave to the open ended questions. Some teachers (26%) mentioned that the role of the learners should be to listen and pay attention to instructions (teacher-centred). To some extent this clash between the teacher and learner centred beliefs can be attributed to the large classrooms, inadequate teaching and learning materials and the limited contact hours in some schools that Zambian teachers, especially first grade teachers, have to contend with. Research has revealed that working with large classrooms can hinder the use of learner-centred activities (Schweisfurth, 2011). Zambian teachers' belief in the learner-centred approach, in line with literature on the benefits of using the learner-centred approach should have produced significant results when the moderation but this was not the case.

6.2.3 Beliefs about personal theories of teaching

With regard to personal theories of teaching, results reveal that the teachers believe that not every child can learn. The word "learn" in this context refers to the acquisition of academic skills such as reading and writing skills. This finding is inconsistent with the other personal theories of teaching that the

teachers agreed with, for example, that teachers should consider individual differences and build upon the unique characteristics of individual learners. The inconsistency arises because if teachers believe that individual differences should be taken into consideration then even those learners that do not perform well academically must have a strength that the teacher can identify and build upon.

This disparity highlights two problems. The first one has to do with the inconsistent nature of beliefs and the disparity that can arise between different beliefs one holds. The second has to do with the emphasis on the importance of academic achievement (more specifically reading, writing and arithmetic) over other areas like sport, art, etc. The latter problem is reinforced by the education system and Zambian society at large which highly emphasizes passing of exams as a benchmark for success. Due to this problem, teaching is conducted solely for the purpose of ensuring the learners pass their exams. Moderation analyses did not produce significant results in this domain. This means that their personal beliefs about teaching and learning do not affect the learning outcomes of their learners. Furthermore, although the Zambian system is heavily exam oriented, exams do not feature heavily at Grade 1 levels where the outcome measures were administered.

6.2.4 Beliefs about the literacy curriculum

The teacher beliefs that emerged from the literacy curriculum sub-scale showed strong support of the Zambia language policy that initial literacy skills should be taught in the local language. This synergy was also observed for the belief teachers have in the use of the phonemic approach to teach literacy. These synergies are important because they highlight a certain level of consensus between how the teachers believe literacy should be taught and Government's current policy. An interesting observation relates to the teachers' belief that teaching literacy in ciNyanja is difficult for teachers whose mother tongue is not ciNyanja and their belief that it is not difficult for children whose mother tongue is not CiNyanja to learn to read in ciNyanja. Teachers were divided on the latter belief. This division could be linked to the belief observed in the teaching approach item that the teacher is the only provider of information in the classroom. It is therefore follows that the teacher should be knowable in the language they are using to teach. The learner on the hand, will acquire the skills from the competent teacher.

It could also be linked to the fact that iciBemba was identified as the mother tongue of the majority of teachers in this study. Therefore it possible that teaching literacy in ciNyanja would be more challenging for the teachers. The use of ciCewa in the curriculum and not ciNyanja could also be contributing to the challenges that teachers are experiencing. It is also possible that the teachers are familiar with town ciNyanja than the ciCewa that is used in the curriculum. The teachers indicated that the version of ciNyanja used in the teaching materials provided by the CDC (which is ciCewa) is difficult for them. Research findings to this effect have been previously established

(Chibamba, 2012; Cihana, 2013; Mambo, 2010). Moderation analysis for this domain did not produce significant results. However, this non-significant result does not undermine the importance of teachers' support of the curriculum. More research will need to be conducted in this area especially in light of the newly implemented curriculum, which can into effect in January, 2014.

Generally weak associations were observed between the various beliefs in this study. The statement that assessed the teachers' belief in the teacher centred approach was positively associated with beliefs about the literacy curriculum. Teachers who believed in the learner centred approach also believed that it is difficult for teachers to teach in a language that is not their mother tongue and also difficult for learners to learn to read. An association was also observed between the learner centred approaches for example teachers who believe that teachers should pay attention to contributions made by individual learners also believe that learners are more important than teachers in the learning process. Belief in the learner centred approach is also interrelated to the personal theory of teaching that if teachers take time to understand their learners, they will adjust their teaching to cater for their individual needs. This personal theory of teaching is also interrelated to beliefs about intrinsic motivation of the teachers such as the belief that the teacher sets tougher teaching standards for themselves then their Head of school does and the motivation belief that they feel they are partly responsible for the education of the learners they teach.

A relationship among the personal theories of teaching items was also observed. The belief that individual learner differences should be taken into consideration in the process of teaching process is interrelated with the personal theory of teaching that teachers could adjust their teaching to suit individual needs if they take time to know their learners. Two interesting relationships have emerged between the belief that every child can learn and (a) the motivation belief that the teacher is motivated when they observe that learning has taken place and (b) the belief that children learn to read faster when they are taught in the local language compared to when they are taught in English. The teachers in the study reported that they believed that not every child learn. According to these results, when they do observe that learning has taken place, they receive some level of gratification, which encourages them to continue teaching. In the case of the literacy curriculum, the result can be interpreted to mean that although they believe that not all children can learn, those that can benefit from the literacy curriculum in the local language. A moderate relationship was observed between the belief that teaching in the local language is effective and the belief that learning to read in ciNyanja is difficult for learners whose mother tongue is not ciNyanja.

Relations among the open-ended variables that assessed what motivates the teachers and what they appreciate most about being a teacher. To the former question, the majority of teachers reported that they are motivated when their learners "breakthrough", this is when they acquire the basic reading skills, while others reported that they were motivated when they achieved the learning objectives of the day. To the latter the majority of teachers reported

that they enjoyed the status and recognition they received as teachers, especially from their learners and their families, while others reported they simply loved to teach. A negative relationship was observed between the responses to what the teachers appreciate most about being a teacher and the number of learners in the classroom. This results indicate indicates the negative effect of large classes on teacher motivation and willingness to teach.

6.3 Being a grade one teacher

The reasons provided by teachers as to why they became teachers were very informative. They shed some light into the nature of Zambian first grade teachers. The theme of intrinsic motivation resonates when teachers are asked what they enjoy most about being a first grade teacher. Most of teachers explained that they enjoyed teaching. Teaching is something that comes naturally to them. They labelled themselves as "the educators of the nation". Others mentioned the interaction they have with the learners as a characteristic of teaching they enjoy. During the focus group discussions, a sense of pride was observed as the teachers talked about the joys of being a teacher. They explained the personal satisfaction they felt when their learners performed well. They explained that although some people joined the teaching profession because it was the easiest option, they love and appreciate their jobs. This explains the teaching experience that some of the teachers in the study have. Sinclair (2008) observed that a long standing career in the teaching profession can only be achieved if an individual is intrinsically motivated to teach. The teachers explained that they viewed their role as a teacher from many different perspectives.

Apart from teaching, the teachers believe they are more like parents to the learners they teach. Learners sometimes share experiences with teachers that they do not share with their parents. They find themselves going above and beyond their normal duties as teachers. This level of commitment and concern for the welfare of learners can only be exhibited by teachers who are intrinsically motivated and have the learners' best interest at heart. This love and concern is reciprocated by the learners. According to the teachers, the learners have a lot of respect and recognition for them. They are always willing to help and please their teachers even in the smallest ways. This kind of reciprocal relationship is important for both the teachers and the learners. Teachers are likely to continue being motivated to teach, while learners are likely to work hard to ensure that they receive praise and recognition from their teachers.

The level of praise received from the learners was not observed for the Ministry of Education. On the contrary, the teachers in the study viewed the Ministry of Education as one that does not appreciate the contribution teachers make to the development of learners and society at large. They explained that the Ministry did not care about their wellbeing as was seen in the lack of

response to their basic needs such as shelter. They believe that the lack of recognition and status in society was largely attributed to the manner in which the Ministry treated them. Studies have observed that the recognition and status in society are important for teachers. Teachers are motivated when they received recognition from society for their efforts in educating the learners (Mutono, 2010; Mwanza, 2010; Watkins; 2000).

The decline of Zambian teachers' status has been documented by various researchers (Mutono, 2012; Mwanza, 2010). A similar observation has been made by studies in other African countries (e.g. Davidson, 2007; Nkechi, 2012; Ofoegbu, 2004;). The decline in the status of teachers in most studies is linked to the poor working conditions and the conditions of service that teachers are exposed to. The story is the same across many African countries, where teachers are failing to make ends meet due to poor salaries. Although the teachers in the present study acknowledged the recent increase in their salaries, many of them received less than what they had expected. Other extrinsic motivators such as lack of proper accommodation (especially in rural areas), lack of proper health facilities, lack of support from school administrators, lack of adequate teaching and learning materials were cited by the teachers. Despite these challenges, teachers were still intrinsically motivated to teach. This finding was also confirmed by other researchers (Davidson, 2007, Kobus, 2009; Nkechi, 2012).

6.4 GraphoGame and teacher variables

In the RESUZ study GraphoGame was used as an intervention. It was administered to a select number of teachers and learners in different intervention combinations. The RESUZ study used GraphoGame to determine if the game would have an effect on the literacy acquisition levels of learners. In the current study, analyses was conducted with teachers who received different levels of instruction before playing the game. What this paper referred to as the TG consisted of teachers who received minimal orientation on the use of the game. The TIG group received intensive instructions on how the game should be played and the benefits thereof. Analyses with these two groups were conducted to find out if there would be an interaction between the GraphoGame intervention received by the teachers and the various teacher variables as focal predictors and learner pre-test scores which acted as covariates. Moderation analysis revealed significant interactions of the intervention with teacher variables, for both the Orthography and Spelling tests.

6.4.1 Orthography test

The teacher variables that produced significant results were: number of learners in the classroom, experience teaching first grade learners and experience teaching first grade learners literacy in the local language. The CG vs TIG and

the teacher variable that assessed the number of learners in a class produced an R^2 of 42%. The results for this analysis highlight the fact that teacher variables do not operate in isolation. They are influenced by many factors and experiences they encounter in their daily environment. Secondly and more important for this study is that GraphoGame intervention enhanced the teachers' ability to effectively teach a large number of learners. This conclusion is derived from the observation that learners whose teachers had been exposed to GraphoGame attained higher post-test scores than learners of teachers in the control group, whose performance decreased as the number of learners increased. The total variance accounted for is quite high, given that the teaching and learning process is affected by many other variables within and outside the learning environment. For example, home literacy background, school climate and many others.

The model that included experience teaching first grade learners as a focal predictor accounted for 39% of the total variance. The intervention group that produced this significant result was TG vs TIG. Learners in the TG group obtained higher post-test scores than learners in the TIG group when the teaching experience increased. The researcher had expected that the TIG would have learners who would obtain higher post-test scores than the TG group because of the intense GraphoGame instructions the group received. One possible reason for this result could be that teachers in the TIG did not play the game as often and diligently as the teachers in the TG because they were given all the information they needed about the game. The teachers in the TG on the other hand could have taken more time to learn and understand the game. Another possible reason could relate to the kind of training that the teachers received. It is possible that the training did not impact and motivate the teachers in the manner that was expected. Another reason could relate to other teachers factors that are beyond the focus of this study, which could have interfered with the effect of the GraphoGame. This finding deserves further research.

Experience teaching first grade learners literacy in the local language also produced significant results with two groups TG vs TIG and CG vs TIG. In the former group post-test scores for learners in the TG increased with an increase in the teaching experience. In the TIG the opposite happened; as the teaching experience increased, the post-test scores of learners reduced. This could be attributed to the reasons explained in the preceding paragraphs. It is possible that because teachers in the TG did not receive intensive orientation they took time to learn how the game works and developed greater mastery of it than the TIG group that received all the instructions. This model accounted for 51% of the variance. In the CG vs TIG the results was similar for the TIG group. The post-test scores of learners reduced as the teaching experience increased. For the CG the performance of learners remained relatively stable. This model accounted for 44% of the total variance. This finding calls for further investigation. What was it about the teachers or the intervention that caused this effect?

6.4.2 Spelling test

Significant moderation results with the Spelling test were found for the exact same variables as the Orthography test; number of learners in the classroom, experience teaching first grade learners literacy in the local language and general experience teaching first graders. Analyses with the Spelling test produced greater R^2 values. This could be related to the fact the Spelling test was a more reliable instrument than the Orthography test. The CG vs TG with the variable "number of learners in a class" produced an R^2 value of 64%. The results is very similar to the finding with the Orthography test on this same variable, learners in the TG performed better in the large classes in comparison to the CG whose performance was negatively affected by the large number of learners. As explained in the above section, this finding is important because it indicates that exposure to GraphoGame imparts knowledge and skills to teachers that enables them to effectively teach large number of learners. This finding is very timely considering the over enrolment that occurs with first grade classes in Government schools.

Experience teaching first grade learners produced significant results with the CG vs TG (R^2 = 55%). This finding is contrary to the previous findings with the TG. In this instance the performance of learners decreased with an increase in the teachers' experience to teach literacy to Grade one learners. The post-test scores are very high for teachers who have less experience. The learners' post-test scores in the control group remained unchanged. This finding requires further exploration, which may relate to teacher and environmental factors beyond the scope of this study.

Experience of teaching literacy in the local languages produced significant results for the CG vs TG and CG vs TIG. The results for these analyses were similar with slight differences in the ΔR^2 values, 53% and 64% respectively. For both TG and TIG post-test scores reduced as the Grade one teaching experience in the local language increased. In these groups, good performance of learners is observed when the teaching experience is less. It is possible that teachers with longer teaching experience had been trained to teach literacy in English and not the local language. The teachers with less experience are probably more effective because they were trained to teach in the literacy in the local language. It is also possible that the quality of the training they received is of better quality than those who were trained earlier. The training skills of trainers may have been refined over the years. It is also possible that more experienced teachers may have had challenges playing and adjusting to the new technology. It is also possible that the new knowledge they received via GraphoGame is confounding with the earlier methods of teaching literacy that they were trained in, that is through the use of English as the medium of instruction.

Reference to the counter intuitive interaction between teachers who were trained to teach literacy in English (older) teachers and those who were trained to teach in the literacy in the local languages (younger teachers) has been made in an attempt to explain the findings that showed that teachers who were more

experienced had learners who performed poorly in comparison to teachers who were less experienced. This finding warrants much greater research as the available information about the teaching experience was very limited in this study. More in depth information about their training experiences in literacy teaching, training in the use of the NBTL etc. would better answer this question. Therefore further analyses has not been conducted. However, the findings in this study certainly warrant research.

This section has revealed that teacher variables interact with factors that teachers are exposed to. The interaction observed in the current study between the intervention groups and teacher variables is a case in point. This raises the need for school administrators, Government, teachers themselves and other stake holders to be mindful about such interactions. This section has also revealed the important role that GraphoGame can play when it interacts with teacher variables. Although few of the results were unexpected, most of the results revealed the important role that GraphoGame can play in improving the quality of teaching. However, it is possible the limited knowledge about the use of ICT in the classroom may have affected their motivation to play the game as often as they should have. Additionally, the fear of moving away from their comfort zones of learning and teaching in a particular kind of way may have also affected their performance and commitment to the game. Various ecological challenges, in a society like Zambia where teachers in Government schools are minimally exposed, if at all, to the use of ICT in teaching may have impacted the results. Many of the teachers in this study have not been trained to use ICT like computers for teaching purposes. In fact during the pilot study it was discovered that almost all the teachers in the study did not know how to use a desk computer, when they were asked to play the game on the desktops. When the game was introduced on the cell phones, some teachers were still anxious about how GraphoGame technology operates and whether or not they were using the phones correctly. It is possible that this anxiety may have interfered with how well and how often the teachers played the game. The moderation results could have also been affected by the teachers' prior knowledge on teaching literacy in English and their teaching practices in English. This prior knowledge could have interfered with the teachers' GraphoGame performance in the local language.

These suggestions are in line with observations made during the RESUZ study regarded the limited exposure time that was observed for a large number of teachers (Jere-Folotiya et al., 2013). It is therefore important that more research is conducted to identify and understand the various teacher personal characteristics and ecological factors that impact how teachers respond to and use the GraphoGame and the impact thereof on learning outcomes. This understanding will help formulate effective research designs with teachers and GraphoGame. Nonetheless, the research findings of the present study are important because they give an idea of how first grade learners perform when their teachers are exposed to GraphoGame, within the Zambian setting.

6.5 Challenges experienced by first grade teachers

The challenges teachers experience in the teaching process, especially in the teaching of literacy are important to acknowledge. These challenges are likely to stifle the teaching process and demotivate the teachers. This in turn is likely to have an impact on the teaching process and learning outcomes. Recognition of these challenges will help suggest solutions to overcome them. Many of the challenges highlighted by the teachers are not new to the teaching profession. They have been observed in the teaching profession for some time. The fact these challenges are experienced at various levels of the education system, primary, secondary and tertiary, is certainly cause for concern. It leads to the assertion that at every level of our education system, learning achievement is affected by these challenges. With regard to first grade, the impact of these challenges can be particularly detrimental. It is at this stage that important basic literacy and mathematical skills are taught to learners. This foundation is important for any future academic learning that the child engages in. Failure to adequately impart these skills could lead to generations of learners who are not adequately equipped with the important reading, writing and mathematical skills. These challenges are divided into two main categories; challenges with the NBTL curriculum and challenges with the teaching and learning environment.

6.5.1 Challenges with the NBTL curriculum

Inadequate literacy time

The teachers explained that they have inadequate time in which to implement the classroom activities assigned for each lesson. The one hour allocated to teach literacy was inadequate to complete the literacy activities for each day. Teachers felt as though they had to constantly rush through the literacy lessons. Even when learners did not understand, the teachers had no time to go back to previous lessons because they constantly felt they would not have enough time to complete the syllabus. Most of the teachers confessed that they never managed to complete the syllabus due to limited time and too many activities that are supposed to be conducted during the literacy hour. Some teachers confessed that in order to complete the NBTL syllabus, they omitted some class activities and rushed through the curriculum. In such instances, the need to complete the syllabus, superseded the important principle that teachers ensure the learners understand what has been taught. Teachers need adequate time to teach effectively and efficiently. The allocated time for literacy teaching in the NBTL does not accord teachers enough time to interact with the learners during the literacy hour. As much as the teacher requires adequate time to implement the lesson plan, learners also require adequate time to learn. Learners require adequate time on task in order to engage in the learning process. Research has shown that teachers who allocate more time to a particular activity have

learners who perform better than those who are allocated less time to perform the same task (Ross, 2002). Adequate time is also important for the management of literacy activities.

Large number of learners

Teachers in the study revealed that the large number of learners in their classrooms made it difficult for teachers to implement the various pedagogical activities. This problem was specifically connected to the ability groups that teachers are expected to work with. The large number of learners in the classroom increased the number of learners in each of these groups. The NBTL stipulates that each group should have a maximum of 10 learners. However, teachers explained that the number of learners in these groups is usually between 15 and 25 learners and each class is expected to have at least four groups. In essence the large number of learners in these groups defeats the purpose of having them. The idea is to encourage learner participation within these groups as the teacher interacts with them. Most teachers actually found the process of managing these groups very tedious. They were of the view that the process of organizing and managing these groups takes up much of the one hour allocated for literacy teaching. The whole process results in a reduction in time on task. The problem of large classes does not affect the implementation of NBTL only. It affects the entire teaching and learning process for other subject areas as well. The poor teacher to pupil ratio affects the quality and quantity of interaction and teacher-pupil relationships. These relationships are important for learner achievement. They have an impact on learners' intrinsic motivation and determination to learn (Bieg, Backes, Mittag, 2011). Large classrooms also make the task of classroom management difficult for the teachers.

Research has supported the use of collaborative learning, such as those used in the NBTL in which learners are divided into groups. In these groups learners can interact and learn from each other. Pintrich (2003) argues that peer encouragement can improve task engagement, which can trigger or enhance individual interest in the task (Hidi & Harackiewicz, 2000). In support for this approach to learning, Turner (1995) argues that it can trigger equilibrium, which can spur curiosity and interest, it can create opportunities for peer modelling. The models could be more effective than adult models. Stipek (1996), although in support of collaborative learning, argues against the use of ability groups. Instead Stipek proposes the use of mixed ability groups with the aim of creating groups that are equivalent in terms of mean ability. Tasks in these groups should be structured so that each student's reward is contingent on the success of all other members of the group. These practices help focus student's attention on effort and reward for group and individual accomplishments. Creating mixed ability groups that can compete against one another can actually improve student motivation. The skills to manage the groups simultaneously is very important.

In Zambia, Mumba (2000) has shown that mixed ability groups can be successfully conducted. .Through the Child-to-Child (C-t-C) approach, Mumba

formed groups of pre-adolescent learners at Kabale Primary school in a town called Mpika. Through these groups he encouraged the individuals within the groups to freely participate and help each other development through various projects in demography and sanitation. The group shared responsibilities for activities such as cultivating nutritious food and carrying clean drinking water to school. It was observed that learners who were part of the C-t-C groups performed better in the secondary school national examination than those who were not in these groups. A follow up study conducted years later with the individuals that had been part of the C-t-C groups revealed that the experience had continued to have an impact on them in early adulthood. It had promoted cooperativeness, community responsibility and self-agency (Serpell, Mumba & Chansa-Kabali, 2011). The skill to mobilise monitor and foster active participation in mixed ability groups is a skill that Zambian teachers could benefit from as they make the transition into the groups during literacy hour. The large number of learners make it difficult to effectively use these groups within the stipulated hour. Furthermore, they have an impact on the learning and teaching materials. Learners can benefit from group work but this benefit can only be recognised if the groups and the activities therein are structured in ways that maximise learning.

Inadequate teaching and learning materials

The large number of learners has a negative impact on the teaching and learning materials. In the case of NBTL the situation is compounded by the fact that many schools have not received any new NBTL kits since the first kits they received. These were given during the inception of the NBTL programme more than ten years ago. These kits are no longer in good condition, they have dilapidated and have missing components. It was clear from the information provided by the teachers that this situation made their teaching very difficult. This situation brings into question Government's commitment to providing good quality education. If teaching and learning resources are in scarce supply then surely the teaching quality and subsequent learning achievement is likely to be affected. Research has shown that the teaching and learning environment can have an impact on teacher motivation (Nkechi, 2012). This problem of inadequate teaching and learning materials is not exclusive to the NBTL. This is a problem that exists across the education system. This leads to frustration on the part of both the learners and the teachers, which leads to poor teaching commitment and possibly poor learning outcomes.

Use of ciCewa in the curriculum

During the focus group discussions, the teachers revealed that both they and the learners experienced challenges with the ciCewa used in the NBTL. They proposed that changes should be made from ciCewa to ciNyanja as the teachers and learners were more familiar with the latter. While it is true that ciCewa is a Bantu language and should therefore be easy for learners to read and write, it is

not the language of play, nor is it the language of communication that the majority of Lusaka families use. This is where the challenge lies with the use of ciCewa. Both learners and teachers have challenges understanding some of the concepts used in the curriculum and sometimes try to deduce the meaning from pictures presented in the books. Research made reference to earlier (Tambulukani & Bus, 2012) revealed the importance of ensuring that there is a match between the language spoken by learners and the language they use in the classroom. With the Government's latest pronouncement that local languages should be used as the medium of instruction in all subjects from Grade 1 to grade 4 in schools nationwide, regions that use ciCewa and not ciNyanja (for example, Lusaka province) could be at a disadvantage. While the pedagogical underpinning of the latest curriculum, the Primary Literacy Programme (PLP) is sound, the use of ciCewa in the syllabus, according to teachers in the current study, has the potential to counter the positive effects of those underpinnings. Although the results of this study revealed that that the mother tongue of the teacher does not impact literacy acquisition, further research needs to be conducted for other subject areas in other grade levels.

Lack of support for the NBTL from parents/caregivers

Teachers explained that parents do not support the use of local language to teach their children to read and write. They explained that parents were ignorant about the benefits of learning to read and write in the local language. They preferred the use of English because they believed that if their children learned to speak, read and write in English, then the purpose of taking them to school had been achieved. The English language is more prestigious than the local languages because it is the language of trade and communication in the workplace. However, research has confirmed that it is not an easy language to learn to read and write because it does not have a transparent writing system (Seymour, Aro & Erskine, 2003). The local languages on the other hand have a transparent orthography, which makes them much easier to learn to read and write (Kashoki, 1990). While some teachers explained that their schools have had several meetings with parents to explain why children it is important for their children to learn to read and write in the local languages, many of the schools represented in the study had not taken such an initiative. It is important to have the buy-in of the parents when it comes to educational matters that affect their children. Without their support, it is difficult to implement educational activities successfully, even those related to the curriculum.

6.5.2 Other challenges experienced by teachers.

Lack of support from administration and fellow teachers

Teachers in the study felt that emphasis in terms of resource allocation was focused more on the higher grades. They lamented about the lack of proper

supervision and leadership by head teachers and school inspectors. The teachers in this study generally felt that they were disregarded as partners in the education process. Decisions that affect their wellbeing as teachers and the teaching process in the classrooms were being made without their input even though they have the experience to input into curriculum development. This observation was also made in the research report by VSO (2002) which stated that "teachers were treated as passive implementers of decisions or even technical input" (p. 1). The important role that teachers play in ensuring effectiveness of education must be understood and taken into consideration. Raffini (1996) emphasizes the importance of relatedness (the degree of emotional security that teachers feel) in fostering intrinsic motivation. A sense of belonging and acceptance and connectedness with other teachers and administrators within the school is very vital to the performance of the teacher. Therefore, when teachers feel as though their efforts are not being recognized and their fellow teachers, school administrators and Ministry of Education officials hold them in low esteem they are likely to become demotivated.

Increased workload

Teachers in the current study highlighted the issue of workload. The workload was mentioned in relation to the literacy curriculum and the number of learning activities teachers were expected to conduct within the literacy hour. It was also made reference to in relation to the number of classes a teacher has to teach and the number of learners in each of these classes. Some first grade teachers are expected to teach more than one Grade one class in a day. Each class has an average of 45 learners. Although teachers are aware that many of the teaching and extracurricular activities they perform are stipulated in their job descriptions, the constant stress that comes with dealing with large classes hinders the performance of teachers. The teachers expressed concern about their workloads, which derailed the fulfilment of their expected or assigned roles within the school setting.

Status in society

An interesting observation during the focus group discussions was the pride that teachers derive when their learners perform well and become responsible citizens. Many of the teachers explained that they enjoyed the attention and respect they received from their learners, the recognition they received from the parents whose children they taught and the contributions that their learners make to the development of society on completion of their studies. The teachers in the current study referred to themselves as "educators" of the nation. They exhibited a sense of pride as they made this observation. This is an indication that most first grade teachers in the study were intrinsically motivated to teach and this intrinsic motivation was enhanced by and extrinsic influence - the status they felt they were given by the learners and parents. This observation is very important because research has consistently shown that the benefits

learners receive from an intrinsically motivated teacher by far outweigh the benefits received from an extrinsically motivated one. Consciously or subconsciously an intrinsically motivated teacher nurtures learners to be intrinsically motivated to learn, (Ryan &Deci, 2000; Wild, Enzle, Nix & Deci, 1997).

However, they felt that this recognition and status was not acknowledged by Government and their fellow teachers. During the focus group discussions the teachers felt that they received very little recognition from their fellow teachers in schools. They believed that this has to do with the fact that they are expected to teach literacy in the local languages, which was not as prestigious as teaching in English. They also explained that part of the problem had to do with the fact that these teachers were more qualified than themselves and looked down on them. School administrators do not help the situation because according to the teachers, they do not support the first grade teachers against this treatment from their fellow teachers. This lack of support from their fellow teachers could dampen their motivation to teach. The school climate in which teachers operate needs to be conducive at all levels to ensure productivity. School administrators need to ensure that this climate exists and that none of the teachers in the school feel discriminated against based on their qualifications or the class they teach.

7 GENERAL DISCUSSION

7.1 Limitations of the study

In this study, quantitative and qualitative data from the teachers was collected using focus group discussions and a semi structured questionnaire. The findings from this study will serve as a foundation upon which future studies on first grade Zambian teachers will be conducted. One of the major limitations of this study is that teacher observations were not conducted. These would have provided first-hand information on how teachers interact with learners. Observations would have accorded the researcher an opportunity to observe some of the constructs that were being assessed. For example, class observations of how teachers implement NBTL; what teaching approaches (learner centred, teacher centred or both) are used by teachers and the teaching methods use in the classrooms. The practical implications of their personal theories of teaching would have also been observed by the manner in which they interact with the learners. Information from observations would have further served the purpose of validating the teachers' responses to the questionnaire.

Furthermore, it would have been desirable to include in the sample, teachers from rural areas within Lusaka district. Even more desirable would be to conduct a study of this nature throughout the nine provinces of Zambia. Due to this limitation, caution should be exercised in generalizing the findings of this study, which was conducted in Lusaka urban province only. Due to limited resources, it was not possible to conduct this study country wide. Findings of this research will certainly provide some insight into teachers' beliefs. More importantly, it will provide a reference point for further studies on teacher beliefs in Zambia.

The purpose of the current study was to explore the general characteristics and their beliefs of first grade teachers regarding motivation, personal theories, teaching approaches and the literacy curriculum. The exploration of teacher characteristics and beliefs was conducted in order to determine the possible effect of these on the literacy acquisition of first grade learners. A teacher questionnaire that consisted of Likert scale items and open ended questions was administered

to first grade teachers from randomly sampled Government schools in Lusaka urban district. Focus group discussions were also conducted with a sub-sample of the teachers. Emergent literacy and decoding skills of first grade learners were measured using the Orthography test and a decoding test. Basic descriptive analyses, inferential statistics and thematic analyses the data in this study. The literacy tool, GraphoGame, was also used in this study to determine if and how it would interacted with teacher variables to impact literacy acquisition of learners. The game was administered to teachers in two main intervention groups: one that received intensive instructions about the game (TIG intervention) or giving minimal instructions (TG intervention).

7.2 Conclusion

7.2.1 Teacher characteristics

The study revealed that generally first grade teachers in Lusaka urban schools possess very low teaching qualifications. The majority of teachers in the study possessed a primary school teaching certificate only. There were very few exceptions that possessed an additional teaching qualification such as a primary teaching diploma or an additional certificate in special education. The first grade teachers are mostly female, the majority of whom have Bemba as their mother tongue even though they teach in ciNyanja. The teachers in this study had varied teaching experience. The majority had less than 10 years of experience at the time of the study. All the teachers had received some PRP training. The majority were trained in NBTL, while few had a combination of NBTL and one other PRP course, such as ROC or SITE. The average number of years the teachers had taught literacy in the local language was two years. More than half of the teachers taught more than one first grade class. The teachers had an average number of 50 learners in their classes.

7.2.2 Teacher beliefs

Findings of the research suggest that although teachers believe they are not adequately paid, they believe they are intrinsically motivated. When it comes to issues of motivation and teachers in Zambia, a lot of attention is focused on extrinsic motivation i.e. better housing, increase in salaries. These findings suggest that both extrinsic and intrinsic motivations are important to the teachers. Teachers in this study reported that they were intrinsically motivated to teach despite the many challenges they experience. Results also revealed that teachers believe learners are unique and should be taught based on their unique characteristics, even though the teachers reported that they do not believe in the universal educability of learners. This suggests teachers recognize that learners are different and should be treated as such. This is an important because learners can be given the individual attention they need to excel in school, based on their

unique characteristics and individual needs. It also means that teachers can identify different areas of strength that individual learners have and possibly capitalize on these for the advancement of the learner. This area of strength may not necessarily be academic.

The study also determined that the teachers believe in the learner centred approach although they believe the teacher should lead the teaching and learning process. This contradiction could be partly attributed to the contradicting nature of beliefs. It could also be attributed to the challenging classroom environments that teachers work in, for example, over enrolled classrooms. With regard to beliefs about the NBTL, the study also determined that teachers believe in the principals on which the NBTL is based on. This includes the use of local language to teach initial literacy. They also support the use of the phonemic approach to impart basic literacy skills. However, they do not believe that the ciCewa (as opposed to town ciNyanja) used in Lusaka supports the teaching process.

The correlations that have been observed in this study given great insight into the interconnections between the teachers' responses. The correlations seem to follow a meaningful pattern which helps understand, to some extent, the nature of first grade teachers in this study and how they perceive their role as a teacher and their various beliefs. Based on the conclusions can be generally observed that the teachers are motivated to teach, they believe in the learner centred approach and are in support of the literacy curriculum. Classroom observed would serve as a great source of information to verify this observation. The various challenges they encounter, such as large classes may negatively affect their teaching. Further research will also need to be conducted to ascertain this assertion.

7.2.3 Qualitative data

The focus group discussions provided in-depth qualitative data about the experiences of first grade teachers. The discussions revealed that most of the teachers in the study enjoy teaching first graders. They enjoy the respect and appreciation they receive from the learners and their parents. The discussions revealed that the teachers consider themselves "educators of the nation". This status makes them very proud to be teachers. They experience a sense of satisfaction when their learners perform well in school and become responsible, productive citizens. However, they feel that the Government should do more in recognizing their efforts. As implementers of policy and curriculum introduced by Government, they should be invited to participate in consultative and planning processes on matters related to teaching and learning. The teachers gave various reasons for why they became teachers. Some believe they were born to be teachers because teaching comes naturally to them. Others believe that teaching runs in their family because their parents were teachers. All the teachers indicated that they enjoyed working with children. The teachers recognize the fact that not everyone can be a good teacher. Some people become teachers because they have failed to study other professions. The information provided in the above paragraph suggests that most of the teachers in this study chose to

become teachers out of love for teaching. This could mean that they were intrinsically motivated to become teachers. This was supported by the identified belief in this study that they are intrinsically motivated to teach. The importance of intrinsic motivation in teaching has already been documented in this paper.

The challenges experienced by first grade teachers are numerous. The teachers highlighted some of these challenges in the focus group discussions. Those encountered in implementing the NBTL include the following: (1) Large number of learners, which makes it difficult for teachers to interact and know individual learners as well as conduct group activities. It also makes classroom management difficult for the teachers. (2) Incomplete NBTL kits. This makes it difficult to implement the NBTL according to the instructions given in the teacher manual. (3) Inadequate teaching and learning materials. This includes furniture, chalk and learner text books etc. (4) Too many teaching activities and inadequate time in which to implement them. (5) Lack of support from fellow teachers, parents and school administrators. (6) Use of ciCewa and not ciNyanja as the medium of instruction in Lusaka. Other challenges they experience as first grade teachers include (7) poor working conditions, for example housing and salaries (8) lack of recognition and appreciation by Government and (9) lack of interest of parents in their children's learning and other school activities. (10) Insufficient contact hours. In some schools, learners do not spend more than 3 hours in school. Many of the challenges highlighted are not new to the Zambian education system. Despite these challenges, the teachers are still motivated to teach.

7.3 Contribution to literacy acquisition

7.3.1 Teacher characteristics

This study has identified various teacher characteristics that impact literacy acquisition of learners. General teaching experience, experience teaching first graders and experience teaching in the local language. These characteristics had an impact on the literacy acquisition of learners when GraphoGame was used as a moderator. This findings highlight the importance of GraphoGame as a potential tool that can enhance teachers' knowledge and skills to teach literacy. With regard to the most effective teacher intervention with GraphoGame, the TG intervention combination generally produced increased post-test scores of learners than the TIG. There are various factors that could have contributed to this finding. More research with teachers and GraphoGame will need to be conducted. Generally, learners in the teacher intervention group (TG) obtained higher post-test scores than learners of teachers who were in the control group. These results reveal that teacher characteristics, such as those that have been identified in this study, in should be taken into consideration when administering GraphoGame to the teachers. Overall, the results from GraphoGame were varied between the intervention groups and deserve further attention in future research.

7.3.2 Teacher beliefs

The theoretical model used in the study was grounded in two theoretical perspectives: Vygotsky's sociocultural theory and Bourdieu's theory of habitus. In the latter approach, Vygotsky (1978) emphasises that learning is a social process which takes place through various cultural and psychological tools. Learning leads to cognitive development when it is conducted through meaningful instruction and learning between the teacher and the learner. The theory explains that cognitive development takes place in the zone of proximal development. The zone of proximal development is the of area exploration for which the student is cognitively prepared but requires help and social interactions to develop. Processes that aid this development include collaborative learning, discourse, modelling and scaffolding by a teacher or more experienced other. The support provided facilitates understanding of knowledge domains and development of complex skills by the learner. Bourdieu's theory of habitus proposes that social norms or tendencies guide the way an individual thinks and behaviours. These social norms are enduring and transferrable from one context to another. They result from an interplay between free will and structures that exist in society.

Based on these two perspectives, the theoretical model in this study proposed that teachers and learners each bring to the classroom various competencies and characteristics based on their cultural historic contexts and experiences. These contexts and experiences contribute to way in which social interactions take place in the teaching and learning process between the teachers and their learners. The model proposed that teacher beliefs about teaching, learning and the curriculum (derived from their cultural context and experiences) influence how literacy is taught in the classroom. Likewise, learners also bring to the classroom personal characteristics based on their cultural experiences and home background, which also contribute to their literacy acquisition. Of importance in this theoretical model is the interaction of some of these factors as the teacher operates within the learners' zone of proximal development and how literacy acquisition is ultimately affected.

In the current study teachers' personal theories of teaching, their beliefs about motivation, beliefs about teaching approaches and beliefs about the curriculum did not influence literacy acquisition. It is possible that the range of personal beliefs suggested by the researcher in the questionnaire did not cover personal theories held by the teachers. Although a vacuum exists in the literature on the impact of personal theories of teaching on literacy acquisition, it is important that teachers reflect on the nature and purpose of the education they give to learners, the role of the learners in this education and their role as teachers. These fundamental philosophical principles guide the many choices they are expected to make in the classroom, whether or not teachers' are conscious of this. The motivation scale revealed interesting findings about teachers' beliefs about their intrinsic and extrinsic motivation. Although the identified beliefs did not impact literacy acquisition of learners in this study, the

findings of the current study that teachers are intrinsically motivated is very encouraging. Findings on teacher beliefs about teaching approaches is also important. The divided response teachers gave about teacher and learner centred teaching approaches highlights the need to explore this belief further in order to determine the reasons for the divide in the teachers' preferences for either approach.

The findings of the current research regarding teacher beliefs are important for both Government and teachers themselves. For the Government, they bring to light a glimpse of some of the beliefs held by first grade teachers. These beliefs are important to know because they influence teachers' decisions and classroom practices. An understanding of beliefs will help Government understand teachers better, with the view of identifying negative beliefs and changing the circumstances that lead to these beliefs. It is equally important for teachers to understand their own beliefs. This will help them understand their behaviour, classroom practices and attitudes. Only when teachers understand their beliefs, will they be in a position to change them, if these beliefs are unhelpful. Ultimately, the learners stand to benefit when both Government and teachers understand the importance of beliefs on the teaching and learning process.

This study was part of a larger research project that aimed to document the effectiveness of improving literacy acquisition skills of first grade learners. The study concluded that GraphoGame accounted for 6% of the total variance of an increase in learners' decoding skills when the teachers and learners played GraphoGame. Based on this finding, it can be deduced that there are other factors that contributed to the literacy acquisition of learners. The main objective of the current study was to contribute to the RESUZ study by focusing on the possible contribution that various teacher beliefs and characteristics would make to the literacy acquisition of learners by focusing on teachers that received the intervention and learners in the control group. This was achieved firstly by focusing on teacher characteristics and beliefs and how these impact literacy acquisition. Secondly it was done by establishing how GraphoGame interacts with the teacher variables to influence literacy acquisition. While the effect of teacher variables was not observed directly, the impact was observed when GraphoGame intervention was introduced.

Research acknowledges the important contribution that teacher factors make to the learning and teaching process. Within the Zambian context, information on this connection was not available. The current study has shed some light on teacher beliefs and characteristics. Introducing new curricula alone is not enough to ensure that literacy levels improve. Curriculum needs to be matched with equally good teachers. The personal characteristics of these teachers, in particular teacher beliefs about teaching and learning and why they decided to become teachers can help identify quality teachers. Additionally, teachers' education itself should be a target of research to establish its quality and relevance. Constant monitoring and evaluations of teachers' education should also be conducted.

7.4 Recommendations

Based on the findings of this study, the following recommendations were made:

- Government should include, in the teacher training curriculum, a component that focuses on teacher beliefs about the curriculum and various aspects of the teaching and learning process, with the view of understanding how these might affect the teaching process. After the training, teachers should be encouraged to explore the beliefs and reflect upon the usefulness of their beliefs in order to understand themselves better. Beliefs influence and guide human behaviour, hence their influence on teaching and learning process. Workshops on exploration of beliefs can be organized to ensure that there is continuity after teachers leave teachers the training colleges. Government changes curriculum as and when they deem fit. It is therefore important to consider teacher beliefs about the old and new curriculum with the view to change beliefs that may hamper the implementation of the new curriculum, especially if it is contrary to the old curriculum. For example changing the literacy curriculum from teaching literacy in English to teaching in the local languages.
- The finding that teachers are intrinsically motivated highlights the need for Government to focus on factors that promote intrinsic motivation and not just extrinsic motivation as is currently the case. Intrinsic motivators such as increased opportunities to improve their qualifications should be encouraged. Government has encouraged teachers to upgrade their qualifications. However, the focus is more on secondary school teachers. Very little emphasis has been placed on early primary school teachers. Improved qualification will lead to an improved sense of competence to do their work. It will also enhance their sense of pride as they accomplish tasks efficiently and effectively. Government should encourage activities that enhance their sense of choice on how best to conduct their classroom activities and the teaching approaches they take in the process of teaching, while still working within the framework of the proposed curriculum. Frequent evaluation and feedback on teachers' performance should be introduced. This will help teachers monitor their own progress, which will enhance their sense of achievement and confidence as their identify areas they are performing well in and areas that need improvement.
- The findings of this research have also highlighted the need for Government to consider the mother tongue of teachers before deploying them to schools across the country. Alternatively Government could first assess whether the language competence of teachers will allow them teach in a particular language even if it is not their mother tongue. This recommendation is supported by the finding that teachers' believe it is difficult for a teacher to teach in a language that is not their mother

tongue. It also highlights the need to reconsider the use of ciCewa in the literacy curriculum as most teachers and learners are familiar with town ciNyanja.

- The need for Government to place less emphasis on passing exams and instead train teachers on how to capitalize on the strengths of their learners. Learners should be trained in how to help learners apply the knowledge they learn in the real world and not just focus on passing exams. Teachers should be encouraged to explore and reflect upon what they teach, why they teach it and how it be taught effectively to the learners. This should be a mandatory part of the teacher training curriculum.
- Government should involve teachers, as stake holders and implementers of education policy, in the consultative and process on matters that affect teaching and learning. This will help create a sense of ownership, which will positively affect the implementation of policy and curriculum at classroom level. Data from the focus group discussions reveal that teachers feel very strongly about their involvement in decision making matters related to the curriculum. They feel they are not consulted and yet they are the implementers on the ground. Teachers have valuable information about what works and what does not.
- Teacher training for literacy teaching, pedagogical issues and child development are all very important. The knowledge from these different areas is interlinked. Teacher training should not focus only on the current literacy curriculum. It should also focus on knowledge related to child development and pedagogical knowledge that relates to it. The six months to one year of training an early grade primary school teacher undergoes to obtain a primary school certificate suggests that the knowledge they gain is very limited. Teacher training should also include strategies on how teachers can deal with challenges they encounter in the classroom. For example, how to conduct and structure group activities in over enrolled classrooms, how to deal with slow as well as gifted learners, additional tips on classroom management, to mention a few. Teacher training should also focus on various teaching styles and methodologies to cater for different learners, understanding of how children learn to read and how to effectively use the ability groups in the classroom. This knowledge should not be emphasized at degree level only. Early grade teachers should have sufficient knowledge to confidently interact, teach and build a strong foundation upon which learner knowledge with be built on in later grades.
- Greater effort should be made to increase the number of schools or increase the number of classrooms within schools to reduce the number of learners in the classrooms. An average of 50 learners in a classroom can be overwhelming for a teacher with no teaching assistant. The large number of learners compromise on the quality of education the learners receive in many ways. Classroom management, assessment and

feedback, individualized attention, co-ordination of classroom activities are made very difficult for the teacher. This is especially the case for first grade learners in Government, many of whom have not been exposed to a structured learning environment (e.g. nursery school).

- There is need for Government to ensure that schools have a constant supply of teaching and learning materials, in adequate quantities. In this study the NBTL kit was identified as either torn, with missing components in most schools. In a few other schools it was unavailable. There is need to ensure that teaching and learning materials for literacy courses are available and in good condition at all times. In the event that Government has problems availing this material, teachers should be trained on how to improvise.
- Further sensitization of parents on the use of local language in teaching literacy should be conducted. Parents are stakeholders in the education of their children. It is therefore important for them to understand what their children are learning and why. In the case of Zambia, where literacy is taught in a language that is supported by the parents, there is need to conduct sensitization campaigns and workshops in order to deal any misconceptions parents may have. This process should not be left to Government alone. Teachers and head teachers also need to play an active role in this process through the Parent teacher Associations (PTAs). Parents play a vital role in the academic performance of their learners. Therefore efforts should be made to actively engage parents at all levels of their child's education.
- The amount of time allocated for teaching literacy should be increased. One hour is not adequate, given the number of literacy teaching activities that teachers are expected to conduct for each lesson. Increased time will give teachers more time to complete their lesson plans without feeling as though they are being rushed. Learners will have more time to participate in the literacy activities and exercises.
- Government should introduce a fixed number of contact hours that all Government primary schools should abide by. This will ensure that all learners are exposed to the same contact hours. Currently the amount of time learners spent in school is determined by the school. Granted, some schools do not have adequate infrastructure, hence the decision to reduce contact hours in order to cater for more classes. Government needs to prioritize infrastructure development in these schools. However, reduced contact hours leads to reduced learning, which ultimately leads to a reduction in the amount of knowledge the learner acquires. Likewise for teachers, this puts them under undue pressure to rush through the syllables. First grade learners in particular need adequate time to cement the literacy skills they are taught. The more time they have to develop the literacy skills in the local language the easier it will be for them to transfer these skills to English. Equally, teachers need adequate time to teach effectively.

- There is a general need to upgrade the standard of the teaching profession so that it is highly respected and popular. This should begin by ensuring that all teachers are well trained at all school levels. Measures should be put in place in schools to ensure that teachers are strongly committed to their work, especially those teaching important foundational courses like basic literacy and mathematical skills. An important profession like teaching should not be viewed as a last career choice, when all other choices have been failed. This means that even the quality of grades needed to enter the teaching profession should be increased to make it more competitive. Likewise, stipulated qualifications needed for a first grade teacher should als0 be increased beyond a certificate.
- Government should consider GraphoGame as a potential tool that could be used to enhance phonemic awareness levels for both teacher and learners. For teachers, GraphoGame can be used to improve their literacy teaching skills. By being exposed to the game, teachers will be exposed to the correct sounds in the local languages. This is especially true for teachers who were trained to teach reading in English. GraphoGame could also be used as a teaching tool in teacher training institutions. This way, teachers can be introduced and trained on how to use the game before they enter the classroom. It can also be used to enhance their phonemic awareness before they even begin to teach literacy. Furthermore, Government should also consider the use of GraphoGame as a supplementary teaching tool by training teachers on how they can incorporate GraphoGame related activities into their literacy classes. Government could also consider the use of GraphoGame for learners. This could be done by making the game available to learners through desk top computers or phones in schools. The introduction of ICT like GraphoGame could act as an initial step to actualizing Governments' ICT policy in education.

7.5 Implications for future research

In line with the current study, additional research will be required in the following areas:

- The study has shown that GraphoGame has the potential to improve the skills and knowledge of teachers who are exposed to. Further research needs to be conducted to find out what other teacher factors interact with GraphoGame and how it can be effectively used for both learners and teachers. Furthermore, research on teacher beliefs and attitudes about GraphoGame will also need to be explored in order to determine the teachers' willingness to use it as a literacy tool as well as identify any possible challenges, hindrances and resistance teachers might have towards the use of ICT in teaching.
- There is need to use observations as a method of data collection, in addition to questionnaires and focus group discussions. Observations will provide additional, first-hand information on the actual practices and classroom activities teachers engage in. It will also provide information that will help verify the responses teachers give about their teaching. For example, through the use of classroom observations, a better understanding on whether teachers prefer either the use of teacher centred or learner centred approaches in teaching. It will also give some insight into what teachers understand by these two concepts and how they implement these approaches in the classroom. Research cited in this study has shown that understanding and implementation of these approaches differ between countries and even between different places within the same country. Information from a research of this nature will help identify training needs in the use of these approaches.
- There is a need to further explore teacher beliefs. Research should broaden the types of educational beliefs that teachers may have. This study only focused on four namely motivation, the literacy curriculum, teaching approaches and personal theories of teaching. In this regard, teachers should be given an opportunity to articulate their educational beliefs, as opposed to be subjecting them to the researchers' particular choice of beliefs.
- In order to obtain a much broader view of teachers' experiences, the entire school context will need to be investigated. To this end the study sample could be extended to include administrators and learners. This would provide a more comprehensive view of teachers' experiences and beliefs and how these operate within the school context. Ultimately information on how these affect learning outcomes will be more comprehensive.
- More research is needed to establish the role of teacher characteristics on literacy acquisition. This is important because it will help ascertain which

teacher characteristics and in what hierarchical order, within the Zambian context, contribute to literacy acquisition.

- Future research on reading acquisition should include actual measures of reading as additional measures. These could be in the form of teacher ratings or texts that children read and are assessed in. This will help provide a clearer picture of literacy acquisition.
- The theoretical model used in the study could be improved upon by focusing on specific variables that relate to those generally referred to in the model. These include: teachers' cultural and professional experiences, learner experiences and competencies.
- Environmental factors that could contribute to literacy acquisition, for example, school climate, availability of learning and teaching materials should be incorporated into the model.

At a much broader level, research is needed in the following areas:

- There is need to conduct research to examine the sociocultural approaches that may affect literacy acquisition of learners, for example, the development of language and the ways in which culturally different modes of discourse both within and between cultures shape the learners' development and impact their educational experiences, as proposed by Vygotsky. There is very little work done in this area. With the array of tribes in Zambia, this information could prove useful for educationists, especially teachers.
- In addition, further research may be necessary to determine how the new education policy (Primary language Programme) is being implemented in schools and what, if any challenges teachers may have in its implementation. This should be done with the view to identifying areas that may need to be rectified, based on teachers' responses.

YHTEENVETO (SUMMARY)

Lukutaito on tärkeä tehokkaan kommunikaation väline, jota tarvitaan nykyaikaisessa yhteiskuntaelämässä menestymiseen. Tutkimus on osoittanut, että Sambian oppijoiden lukutaitotaso jää merkittävästi odotetusta. Sambiassa on tehty huomattavia investointeja lukutaitoa tukeviin opetusohjelmiin. Viimeksi Primary Reading Program (PRP) on painottanut tutun paikallisen kielen käytön merkitystä lukemaan opetuksessa kolmen ensimmäisen luokka-asteen opetuksessa. Kuitenkin sen vaikutuksia valottava kansallinen tutkimus osoitti, että niiden lasten osuus, jotka saavuttivat edes minimitasoisen taidon odotettuun standardiin verrattuna 5.-6. luokille mennessä, jäi erittäin matalaksi. Opettajilla on keskeinen rooli julkisen tuen piirissä olevien koulujen oppimismahdollisuuksien välittämisessä lukemaan oppijoille. Tässä tutkimuksessa keskityttiin ensimmäisen luokan opettajiin ja erityisesti heidän noudattamiinsa käytänteisiin ja ylläpitämiinsä uskomuksiin tavoitteena saada selville missä määrin näillä seikoilla on vaikutusta Lusakan alueella alkavan lukutaidon oppijoiden edistymiseen. Tieto- ja kommunikaatioteknologiaa hyväksi käyttäen tutkimus pyrki edelleen saamaan tietoa siitä, missä määrin lukutaidon tukiväline, Graphogame™ (GG) voi yhdessä opettajan toimien kanssa vaikuttaa lukutaitoa parantavasti.

Havaintoaineisto tutkimusta varten koottiin osana laajempaa Suomen Akatemian ja ulkoasiainministeriön tukemaa kehitystutkimushanketta ”Learning environment for the acquisition of the basic reading and math skills: implementation study in a developing country with regular orthography” (SA päätösnumero 133237), joka tunnetaan nimellä RESUZ (Reading Support for Zambian Children) eli Sambian lasten lukutaidon tuki -hanke. RESUZ-hankkeen lisäksi Suomen ulkoministeriö on tukenut Sambian yliopiston kehittämistyötä ja asiantuntemuksen kasvua Korkea-asteen oppilaitosten kapasiteetin vahvistamisen tukiohjelmaan (HEI ICI) kuuluvassa CAPOLSA-hankkeessa (The Centre for the Promotion of Literacy in Sub-Saharan Africa), jossa on kehitetty lukutaidon kehittämisen osaamiskeskusta Sambiaan yliopistoon (valtionapupäätökset HELM406-5 ja HELM406-10). Molemmissa hankkeissa kumppanina ja vastuuorganisaationa oli Jyväskylän yliopisto ja sen Agora Center.

RESUZin tutkimusasetelma oli luonteeltaan kokeellinen. Tutkimuksen ytimessä oli Graphogame-pohjaisen intervention vaikutuksen havainnointi. Vaikutusta observoitiin vertailemalla erilaisia ryhmiä sen mukaan, missä määrin niiden oppiminen saattoi pohjautua yhtäältä GG:n ja toisaalta opettajan tai niiden yhteiseen vaikutukseen. Tutkimus perustui sekä kvantitatiiviseen että kvalitatiiviseen aineistoon. Tutkittavina oli ensimmäisen luokan opettajat (N=63, ikäväli 25–54 vuotta) Sambian julkisesti rahoitetuista kouluista ja heidän 6–9-vuotiaat oppilaansa (N=288). Opettajilta koottiin itseraportoituja omia opetuskäytäntöjä ja opetusta koskevia asenteita sisäisestä ja ulkoisesta motivaatiosta, oppija- versus opettajakeskeisestä lähestymistavasta, persoonallisia teorioita opetuksesta ja näkemyksiä opetusohjelmasta käyttäen puolistrukturoitua

kyselylomaketta. Lasten lukutaidon kehitystä ja oppimista arvioitiin paikallistarpeeseen kehitetyillä kynä- ja paperitesteillä, joilla arvioitiin paikalliskielen, ciNyanjan, oikeinkirjoitusta tunnistamistekniikalla ja kirjoitusjärjestelmää koskevaa tietoisuutta. Aineistonkäsittelyssä kuvaavia tilastotekniikoita täydennettiin yksinkertaisilla moderaatioanalyyseillä.

Tulokset osoittivat, että opettajat kannattivat paikalliskielen käyttöä ja foneettiseen menetelmään perustuvaa lähestymistapaa lukutaidon opetusohjelman mukaisesti. He uskoivat, että ne tukevat Sambian ensimmäisen luokan oppilaiden lukutaidon oppimisprosessia. Opettajat myös uskoivat, että oppilaskeskeinen lähestymistapa on opettajakeskeistä tehokkaampi opetuksessa. Yhtenä opetusta koskevana henkilökohtaisena teorianaan opettajat raportoivat, etteivät he usko, että kaikki lapset pystyvät oppimaan. Tulokset paljastivat myös opettajat sisäisesti motivoituneiksi, vaikka he kokivat, etteivät saaneet riittävästi korvausta työstään. Opettajien ominaisuuksia tai uskomuksia koskevilla muuttujilla ei ollut moderaatioanalyysien mukaan osuutta opettamiensa lasten lukutaidon oppimisessa. Mutta kylläkin GG:n vaikutusten realisoitumisessa esimerkiksi niin, että merkitseviä vaikutuksia oli sillä, kuinka suuren oppilasmäärän luokissa opettajat ovat työskennelleet, kuinka paljon heillä on kokemusta lukutaidon opettamisesta ensimmäisellä luokalla ja kuinka paljon heillä on kokemusta lukutaidon opetuksesta paikallisella kielellä.

Tutkimustulokset mahdollistavat seuraavat suositukset: CiNyanjan käyttö Lusakan alueen valtionkouluissa on perusteltua. Opettajien sisäistä motivaatiota ja oppilaskeskeistä opetuksen lähestymistapaa on pyrittävä tukemaan. Alaasteen opettajien pätevyysvaatimuksia lukutaidon opettamisessa on nostettava. Graphogamen avulla on mahdollista parantaa opettajien lukutaidon opetuksen taitoja Sambiassa.

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APPENDIX 1: Teacher Demographic Questionnaire

THE UNIVERSITY OF ZAMBIA
RESUZ PROJECT
Teacher Questionnaire.

Instructions to teachers: Please respond to all the questions in this section. The responses you give in this questionnaire will be held in the strictest confidence.

Name of school: _____
Teacher ID/name: _____
Physical address: _____
District: _____
Telephone: _____

PART 1: PERSONAL BACKGROUND INFORMATION

1. What is your gender? 1. Female ☐ 2. Male ☐

2. Date of birth? _____

3. What is your marital status?
1. Single ☐ 2. Married ☐ 3. Divorced ☐ 4. Widowed ☐

4. What is your nationality? 1. Zambian ☐ 2. Non Zambian ☐

5. What is your mother tongue (the first language you mastered as a child?

---

6. How many Grade 1 classes do you teach? _____

7. Approximately how many students do you have in each class now?

PART 2: EDUCATIONAL QUALIFICATIONS

8. Indicate which of the following teacher education qualifications you have.
(where appropriate you may tick more than one option)

1. Pre-school teachers' certificate
2. Primary Teachers' certificate
9. Bachelor's Degree with Education
10. Bachelor's Degree

3. Advanced Primary Teacher certificate
4. Primary diploma
5. Certificate in Special Education
6. Diploma (Basic or Secondary)
7. Special Education Diploma
8. Advanced Diploma
11. Special Education Degree
12. Masters degree
13. None

9. Which of the following Primary Reading Programme components were you trained in?

1. NBTL ☐ 2. SITE ☐ 3. ROC ☐ 4. All ☐ 5. None ☐

10. What was the duration of the training?

1. No separate training associated with PRP ☐
2. A course given in one day ☐
3. 1-3 days ☐
4. One week ☐
5. More than one week ☐

11. Did you receive training in any of Zambian Local Languages to be able to instruct successfully in initial literacy? 1. Yes ☐ 2. No ☐

12. How long have you been teaching?

_____

13. How long have you been teaching Grade ones?

_____

14. How many years have you taught first graders to read a local language?

Thank you for your co-operation

APPENDIX 2: Teacher Beliefs Questionnaire

School: _____ **Teacher ID:** _____

The following statements make reference to the NBTL. Please tick the response that most accurately reflects your view on each of the statements.

		strongly disagree	disagree	I am not sure	agree	strongly agree
.	Children learn to read faster when they are taught initial literacy in a local language from the beginning than when they are taught in English					
.	Learning to read in CiNyanja is difficult for children who **do not speak** CiNyanja at home.					
.	Teaching initial literacy in Nyanja is difficult for a teacher whose mother tongue is **not** CiNyanja.					
.	Emphasis on the letter-sound correspondence in the NBTL programme is effective in helping children learn how to read					
.	The version of CiNyanja in the NBTL makes it difficult for pupils in Lusaka to acquire literacy skills.					

The statements below make reference to the teaching and learning process. Please tick the response that most accurately reflects your view on each of the statements below.

		strongly disagree	disagree	I am not sure	agree	strongly agree
.	In the classroom the teacher is the only provider of information					
.	In order for pupils to learn, they must focus and concentrate on the teacher.					

.	For effective learning to occur, the teacher needs to be in control of the direction of learning.					
.	In the teaching process, the pupils are more important than the teachers					

Below is a list of items that describe how a teacher may feel about various aspects of his/her job. Please choose the extent to which you agree or disagree with these statements. Tick the response that most accurately reflects your view.

		strongly disagree	disagree	I am not sure	agree	strongly agree
1.	One of the best things about teaching is seeing the pupils learn					
2.	My salary is adequate for the amount of work I do					
3.	I am personally responsible for part of the education of every pupil I teach.					
4.	I set tougher standards for myself than my head sets for me.					

The following statements make reference to the learning process. Please tick the response that most accurately reflects your view on each of the statements below.

		Strongly disagree	disagree	I am not sure	agree	strongly agree
1.	Every pupil can learn.					
2.	Teachers must take into consideration the individual differences of pupils when teaching					

3.	If teachers take the time to listen and understand their pupils, they will change their teaching to cater for individual pupils					
4.	Each child brings to the classroom unique characteristics which the teacher should discover and build on when teaching					

Briefly answer the following questions as they apply to you personally. Take a moment to think about yourself as teacher.

(a) When you are teaching, what is the most important thing you want to achieve? / What motivates you in the process of teaching?

_____
_____
_____
_____
_____
_____

(b) When you are teaching what do you think the role of your pupils should be?/What do you expect from your students when you are teaching?

_____
_____
_____
_____
_____
_____

(c) What do you appreciate the most about bout being a teacher?

_____
_____
_____
_____
_____
_____

(c) What do you dislike the most about being a teacher?

_____
_____
_____
_____

_____
_____

(d) As a teacher of literacy, what do you experience as your greatest challenge in teaching children to read?

_____
_____
_____
_____
_____

APPENDIX 3: Correlation tables for teacher beliefs

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. NBTL 1	1																
2. NBTL 2	.17	1															
3. NBTL 3	.00	.55**	1														
4. NBTL 4	.05	-.09	-.22	1													
5. NBTL 5	.09	.09	.18	-.09	1												
6. TL 1	.14	.04	-.06	-.08	.05	1											
7. TL2	.00	.28*	.35**	-.10	.07	-.02	1										
8. TL3	.07	-.16	-.06	-.08	-.05	-.17	.00	1									
9. TL4	.14	.00	.07	.17	.16	-.07	.04	.43**	1								
10. MOT 1	.12	-.05	-.13	.16	.08	.17	-.12	-.07	.14	1							
11. MOT 2	-.11	.13	.17	.26*	.16	.01	-.10	-.15	.21	.02	1						
12. MOT 3	.06	-.06	.05	-.05	-.11	-.06	-.01	.23	.15	.12	-.06	1					
13. MOT 4	-.09	-.15	-.08	.00	.03	-.07	-.19	-.13	.06	.07	.06	.21	1				
14. PT 1	-.29*	-.05	.06	.04	-,02	-.33*	.14	.08	-.11	-.27*	-.13	-.17	.02	1			
15. PT2	.03	-.10	-.21	.36*	-.14	-.13	-.19	-.03	.14	.15	.03	.20	.38**	-.06	1		
16. PT3	.06	.00	-.22	.08	.11	.07	-.14	.01	.36**	.17	-.02	.32*	.36**	-.13	.27*	1	
17. PT4	.18	-.15	-.07	-.03	00	.12	-.22	.06	.04	.03	-.15	.23	.22	-1.5	.18	.13	1

(N=63) *p<.05. **P<.01

LITERACY CURRICULUM

NBTL 1: Children learn to read faster when they are taught initial literacy in a local language from the beginning than when they are taught in English

NBTL 2: Learning to read in CiNyanja is difficult for children who ***do not speak*** *CiNyanja at home.*

NBTL 3: Teaching initial literacy in Nyanja is difficult for a teacher whose mother tongue is ***not*** *CiNyanja.*

NBTL 4: Emphasis on the letter-sound correspondence in the NBTL programme is effective in helping children learn how to read

NBTL 5: The version of CiNyanja in the NBTL makes it difficult for pupils in Lusaka to acquire literacy skills.

TEACHER AND LEARNER CENTRED APPRAOCHES

TL 1: In the classroom the teacher is the only provider of information

TL 2: For effective learning to occur, the teacher needs to be in control of the direction of learning.

TL3: In the teaching process, the pupils are more important than the teachers

TL 4: Paying attention the pupils' point of view is the key to their good performance in school.

MOTIVATION

MOT 1: One of the best things about teaching is seeing the pupils learn

MOT 2: My salary is adequate for the amount of work I do

MOT 3: I am personally responsible for part of the education of every pupil I teach.

MOT 4: I set tougher standards for myself than my head sets for me.

PERSONAL THEORIES OF TEACHING

PT 1: Every pupil can learn.

PT 2: Teachers must take into consideration the individual differences of pupils when teaching

PT 3: If teachers take the time to listen and understand their pupils, they will change their teaching to cater for individual pupils

PT4: Each child brings to the classroom unique characteristics which the teacher should discover and build on when teaching

APPENDIX 4: Correlations for teacher characteristics and quantitative measures

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Age	1										
2. Grade I classes taught	-.25	1									
3. Number of learners taught	-.22	.42**	1								
4. General teaching experience	.82**	.12	-.14	1							
5. Experience teaching Grade 1 learners	.36*	-.13	-.20	.49**	1						
6. Experience teaching in local language	.37*	.09	.08	.39*	.83**	1					
7. What motivates teacher	-.12	.10	-.17	.06	-.16	-.24	1				
8. Role of learners in teaching process	.19	.00	.05	.08	-.20	.02	-.30	1			
9. Appreciate the most about being a teacher	.00	-.19	-.38**	-.05	-.09	-.17	.31*	-.03	1		
10. Dislike about being a teacher	-.04	-.05	.02	-.05	-.22	-.15	.00	-.01	.02	1	
11. Greatest challenges	-.06	-.04	-.10	.13	.16	.08	.12	-.21	-.05	-.06	1

**p<.05. **p<.01. ***p<.001*