

Key issues in teaching children reading in Lungwena, Mangochi District, Malawi.

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ABSTRACT: *The study explored key issues requiring consideration in designing reading instruction. The study adopted a standardised early grade reading test levelled for children with two years of equivalent primary education. The test items included letter knowledge, syllable reading, familiar word reading and oral reading fluency. The reading test was conducted for 276 children out of a population of 840 students that were enrolled for an early nutrition supplementation programme in Lungwena, Mangochi District in Malawi from birth and were supported with food supplements for 36 months. At the time the study was conducted, the average age of the children was ten (10) years. Further information on school resources endowment and support that children get on learning to read was collected to assess how this complement reading instruction. All the factors were regressed through a structural equation modelling to determine their association to the ability of children to read. Results showed that mastery of syllables and familiar words reading explained the variation in the reading scores for children. Furthermore, absence of bullying in schools and reading practice by children were critical to the variation of reading scores, hence requiring emphasis in the development and implementation of reading instruction.*

KEYWORDS –Reading, Phonics, Children, Malawi, Instruction

I. INTRODUCTION

The acquisition of reading skills is a necessary prerequisite for the learning process. Students who have mastered reading skills achieve higher learning outcomes and critical thinking abilities [1]. However, more than 617 million children worldwide do not achieve minimum proficiency levels in reading. Of these, 387 million children of primary school age will not read proficiently, nor will they sufficiently perform their studies by completing primary education .

The preceding implies that 387 million children will be left behind and cannot meaningfully sustain learning gains throughout their life. In addition, pupils who are left behind will not achieve high economic development since high education levels correlate with high social and economic returns[2]. The status quo is in opposition to significant efforts made to develop curricula and specialised reading programmes that have aimed to address the teaching of reading to pupils in early grades. Where such measures are in place, the emphasis has been on classroom-based reading instruction and the availability of various titles in the text so that pupils have a wide variety of textbooks and storybooks to read from and practice their reading skills, including

comprehension. Notably, such dedicated reading programmes have been implemented in Sub-Saharan Africa. Countries such as Liberia, Ethiopia, and Malawi have since 2010 been implementing reading programmes to raise the skill profile of pupils enrolled in the early grades.

Several countries have adopted the teaching of reading through a phonics-based approach that stipulates a linear process of learning to read. This process begins with the naming of alphabet letters, followed by a repeated process in which pupils learn the sounds of the letters before teachers introduce them to blending the sounds into syllables. After that, the teachers introduce short words so that the pupils can create syllables and decode the letters in the words. Later, the teachers take the pupils through phrases and simple paragraphs and teach comprehension skills to enable the pupils to read with understanding [3].

Notably, the phonics-based approach lately introduced in several countries is grounded in Behaviourist Reading Theory. According to this theory, learning results from a stimulus, a response, and the association between the two. It posits that learning changes occur out of the form and frequency of the visual performance by the learner [4]. The fundamental premise of the theory is that repeated actions by both the teacher and the pupil improve the pupil's capacity to learn to read. While this is consistent with the phonics approach, it is particularly noticeable in lower skill sets, such as letter naming, letter sounding, and syllable segmentation, where repetitions are effective. For high-order reading skills, such as reading fluency, the phonics approach thrives on the reading theories such as the Information Processing Model, Automaticity Theory, and Ehri and McCommick's Word Learning Theory. The Information Processing Model emphasizes knowledge of the visuals and sight words as aiding reading fluency rather than the gains attributed to behaviourism [5]. Therefore, much as behaviourism is fundamental to teaching phonics, higher-order reading tasks such as reading fluency require adaptation of theories, such as the Information Processing Model. Readers' differences in visualising and sighting words remain key in how well a pupil reads.

Therefore, this study sought to find out key determinants and issues that lead to the ability of pupils to learn reading. In particular, the study examined the implementation of the phonics approach to the teaching of reading in the study area and assessed whether children read well by going through the phonics routines or not. Further to the assessment of the phonics, the study examined contribution of school resources, teacher behavioural practices, and routines that children undertake in learning to read at school and at home.

II. KEY LITERATURE ON READING INSTRUCTION

The study assessed literature that informed and defined the following concepts – Reading, school resources and reading instruction behaviours that have been proven to facilitate improved ability of children to learn to read.

1) Reading

Reading is both a concept and a process with numerous definitions. Although there are numerous definitions, reading generally entails making sense of printed words, which involves recognising the words and understanding their meanings [6].

In this study, reading proficiency is used to categorise readers. This study distinguishes between high-level and low-level reading proficiencies. This distinction presupposes that pupils with higher level reading skills have high reading scores and the ability to interact with texts. In contrast, the pupils with low reading scores have low-level reading skills and exhibit difficulties understanding texts. Therefore, pupils with poor reading proficiency cannot demonstrate the reading proficiency skills that are typical and consistent with pupils with better reading proficiency [7]. In other ways, those who cannot decode letters and read syllables and

familiar words cannot comprehend a passage they cannot read proficiently. However, this view is mechanistic because it confines learning to read to mastery of prereading skills and precludes those that can read through mastery of the whole word approach to reading. Nevertheless, pupils can read whole-words texts even if they lack the phonics skills necessary for acquiring prereading skills. This noteworthy observation is evident in pupils who learn to read using approaches other than phonics.

For instance, the whole-word approach to learning to read, where sight words and the context in which the word is introduced are important as opposed to the mechanical decoding process promoted in the phonics-based approach to reading instruction. The pupils using other approaches to reading besides the phonics-based approach will, at a minimum, have challenges decoding the letters in the word just read. Nonetheless, with regular practice, such pupils will read the words in the text without hesitation. The aforementioned challenges motivate the tendency to define reading through hierarchies and rank readers according to the mechanics ascribed in the phonics-based reading approach. This approach ranks the skills from low-level text decoding to comprehension of the text read. This motivation opens the proficiency view of reading to more scrutiny as a definition of reading instead of a process or stage in reading. It is at this stage in the process of reading that the measurement and classification of readers form the basis of this study. Therefore, the study recognises the definition of reading as making meaning of the printed text. However, the study analyses reading proficiency to determine how well pupils can read based on individual, school, and household factors that influence their reading ability.

Regardless of the issue of reading proficiency hierarchies, it is generally acknowledged that reading is a product of decoding and linguistic comprehension skills [8]. Therefore, the definition of reading appears to be limited to two parts: text decoding skills and reading comprehension. In recent years, however, the definition of reading has been expanded to include the reader's ability to reflect on written texts and use these texts as tools for attaining individual and societal goals, often known as 'reading to do'. In this sense, the Progress in International Reading Literacy Study (PIRLS) defines reading as the ability to comprehend and use those written language forms required by society and valued by the individual. Readers can construct meaning from texts in a variety of forms. They read to learn and participate in communities of readers in school, in everyday life, and for enjoyment [9]. Worth noting is that the emphasis in the definition of reading is shifting from demonstrating fluency and basic comprehension to the ability to apply the text read to new situations or projects.

While the study accepts the general definition of reading as making meaning out of the text, the study uses reading fluency to proxy reading proficiency within the reading process. The study duly acknowledges that reading fluency is a stage in the process of reading. In addition, the study uses reading comprehension and extended reading comprehension as part of the duly measured products to ascertain and profile young readers. Therefore, reading fluency is defined as reading accurately at a quick rate with appropriate prosody, as espoused by Gilakjani and Sabouri (2016) [10].

Cognisant of the reading profiling levels introduced above, the study investigated the process a pupil must undergo to reach such a stage in acquiring reading skills and reading fluency. Therefore, the study's reading concept also considers the prereading skills that pupils must acquire before developing the skills to read well and fluently. Thus, the reading concept will also encompass the pupil's ability to decode text within a specific timeframe, vocabulary building, letter-sound knowledge, and sight word fluency. In doing this, the elements needed for fluent reading and how they relate to each other in a multilayered fashion in young readers were discussed. Furthermore, the implications of this model in developing and assessing reading fluency are examined in relation to the preceding definition of reading.

Regardless of the theory underpinning the teaching of reading through a phonics-based approach, the theoretical base assumes that a pupil learns to read by first mastering the prereading skills (letter naming, letter knowledge, letter sounds, and syllable segmentation). Furthermore, this process precedes decoding the letters, reading and making words before proceeding to meaning-making out of the letters one reads. Other factors, including cognitive, affective, socioeconomic, background, and text affect how pupils grasp and implement the approaches in their attempts to read fluently.

To gain a deeper understanding of how cognitive factors such as working memory and anxiety influence pupils' reading ability, structural modelling of 330 children's ability to solve verbal and non-verbal mathematics revealed that working memory plays a crucial role in the ability of pupils to solve verbal mathematics. Mathematical reasoning was significantly influenced by reading comprehension and anxiety [11]. The study showed that cognitive factors, such as working memory, influence pupils' ability to comprehend a text. In addition, anxiety caused by a failure to comprehend a text hinders a pupil's ability to make the meaning of words read. Therefore, regardless of the reading approach pupils are subjected to, their working memory is impacted if they cannot read and comprehend within a given timeframe. As a result, they are less capable of comprehending the subject matter. Therefore, cognitive factors should be central to a reading approach, as they provide a framework within which a pupil can successfully engage in academic work. Notably, two critical issues are at play: general language comprehension and retrieval in response to visual input, regardless of whether the information is linguistic. Therefore, text knowledge and granular structural process in reading acquisition cannot be seen as the primary source of learning to read. Instead, consideration must be given to the background language and vocabulary of the pupil, as well as the cognition and retrieval of the text's meanings, regardless of the order of their placement. This aspect of retrieval is critical in understanding the text that pupils read. As the ability to read is not universally possessed by pupils, developing reading instruction necessitates thoughtful consideration.

Another study on reading disorders, mathematics, and attention examined the relationships between phonological awareness, numerosity, working memory, and processing speed in relation to reading, mathematics, and attention. The study showed that working memory and phonological awareness affect pupils' ability in reading and mathematics. Furthermore, numerosity was highly correlated with the co-occurrence of mathematics and attention [12]. This finding indicates that the pupil's attention during the learning process is crucial for the development of later-used cognition. As this pertains to the phonological development of pupils, they must be attentive during the learning process, regardless of the theories that inform a learning curriculum. Therefore, the ability of teachers to develop an approach to teaching that captures the pupils' attention can be institutionalised within the curriculum delivery. However, the curriculum developers need to be aware of the context within which the curriculum will be implemented. For instance, teaching content that requires much attention from the pupils will be ideal for smaller classrooms with a low pupil-to-teacher ratio. This case is evident when compared to classrooms with many students, given the attention span of the pupils and the time limit within which a teacher is expected to deliver instruction.

These findings pertain to the phonics-based teaching approach that pupils must undergo in classrooms that have an average of sixty-three (63) pupils, and in some cases, more than one hundred (100) pupils per classroom and a teacher [13]. In this instance, pupil attention affects cognition and the ability to learn to read; therefore, the design of a reading curriculum must go beyond theories on reading, and the concept of reading in this thesis, will consider class size as a proxy factor for teachers' ability to maintain pupil attention. In contrast, pupils learn and later influence reading ability as measured by reading fluency and comprehension.

Further studies have linked reading ability to the execution of eye movements, decoding, and speech production, concluding that an emphasis on decoding slows reading fluency [14]. This position implies that the

concept of reading through a phonics-based approach, which thrives on the ability to decode text, pronounce letters and text, and make meaning, may potentially slow the number of words a pupil can read in a text. Therefore, the conceptual definition of reading in this study will acknowledge the possibility of having pupils learn to read through mechanistic phonics, which has the potential to slow down pupils' reading speed. Even though meaning-making is the primary goal of reading instruction in academic curricula, there is no scientific consensus on the order in which fluency and meaning-making must occur for pupils to become proficient readers.

In addition to the discourse on cognition related to reading instruction, studies on children with reading disabilities have shown that such children face cognitive and socio-emotional challenges resulting from their inability to read at the same rate as their peers. However, given support for cognitive resilience, which essentially happens through dedicated positive reinforcements and supportive instructional environments, pupils with reading disabilities can be resilient and develop cognitive abilities to read. Further research indicates that their inability to read culminates in emotional breakdowns that, if unaddressed, may further undermine their reading efforts. Therefore, it is paramount that such pupils receive socio-emotional support to build their resilience to learn to read. Peers and supportive adults, including teachers greatly value such assistance [15].

Reading instruction necessitates a focus beyond curriculum theory. It extends attention to the supportive mechanisms set by the curricula, school, and home environment for pupils with reading disabilities. This study promotes inclusion and reading practice for pupils with an innate potential to graduate with abilities comparable to their peers. Therefore, the concept of reading theory cannot be considered in isolation. It requires supportive mechanisms to be put in place for emerging readers, those with reading difficulties to utilise the support of peers reading at the appropriate level, and teachers to have the capacity and opportunities to support remedial reading, whether in a classroom setting or at home. Such support fosters the cognitive and emotional resilience required for students with difficulties to continue on the reading trajectory and maintain reading gains whenever they are registered.

Peng & Kievit (2020) [16] contends that academic and cognitive skills are essential for pupil development. Such research has revealed that reading and mathematics performance predict cognitive abilities (i.e., working memory, reasoning, and executive function) and that the relationship is bi-directional. Further gains are due to quality classroom instruction, which builds the ability to read in disadvantaged pupils, particularly those from low socioeconomic backgrounds. These findings highlight that theories of reading should not only be structural, but also strive to enable teachers to deliver instruction with ascertained quality and consistency so that pupils from low socioeconomic quintile households are not left behind. The backgrounds of the pupils are not identical. Therefore, the pupils require 'differentiated, levelled, and customised support. This approach is challenging for teachers in overcrowded classrooms. It may compromise the delivery of reading strategies grounded in sound academic theory. Thus, reading proficiency and its implementation success in this concept extend to the socioeconomic status of pupils, as measured by variables such as the number of meals they take in a day and the availability of resources in their homes.

Scientific research has shown that pupils develop an emotional attachment to reading based on the characters they interact with through text read to them. Pupils' exposure to such characters depends on the support they receive at home either through being read to or reading by themselves. This opportunity depends on their home environment and their access to non-academic texts [17] (Chansa - Kabali & Westerholm, 2014; Yamashita, et al., 2017; Price & Kalil, 2018; Ramirez, et al., 2019). This love of reading is contingent on the earlier distribution of levelled reading materials to pupils. With this affection, pupils seek out additional texts and narratives to develop their reading ability further. In addition to reading instruction based on phonics reading theories, the ability to read fluently and with understanding is further enhanced by reading diverse titles

from supplementary readers in addition to required textbooks. The reading definition in this concept will thus extend to affectionate reading and the measurable effects this has on the success of a reading approach measured by reading fluency and comprehension.

In summary, the conceptual definition of reading provided by this study extends beyond the theory and mechanics of reading instruction associated with a phonics-based approach. The conceptual contributions of some of the factors that contribute to the establishment of reading in early stages, such as cognitive, affective, and socioeconomic factors, background, and text availability in pupils' homes, are considered as key to the pupils' ability to learn to read. These factors significantly contribute to the effectiveness of classroom-based instruction on reading. Therefore, these elements are conceptualised and discussed in subsequent sections of this conceptual framework. This discussion is for the examination and analysis of modelling a reading intervention contextualised to the socioeconomic characteristics of the area where early-grade reading instruction is implemented. This conceptual position investigates the context in which reading instruction occurs to complement reading instruction. This position is critical because theory-based approaches do not exist in a vacuum; they insist on contextualising the concepts.

2) School resources

The study is well informed regarding the role that school resources play in the condition and standards of the learning environment and how this affects the pupil's ability to learn. Several studies attest to the positive effect that well-resourced schools have on the ability of pupils to learn well [18], Previous research has also shown that pupils often perform better in schools where there is access to clean spaces [19], low pupil to teacher ratio [20], low pupil to classroom ratio and availability of texts [21] compared to schools where such resources do not exist. Therefore, the study collected data on a vector of variables indicating the availability of substitute school resources. Such variables included the availability of teaching and learning materials, libraries, adequate classrooms, staff rooms, teachers, water and sanitation facilities, and access to electricity.

In the vector of school resource factors, the study included the availability of libraries, with the research focusing on permanent or makeshift libraries, staff rooms, and book boxes kept by school personnel. This factor also included reading books available in schools for purposes of lending them out to pupils for classroom preparation time, home use, or other purposes, if a record was kept to trace the books and ensure that pupils were responsible for returning the books upon completion of the loan period. This was included on purpose in the school resource vector to validate whether the availability of school libraries has ever affected the way pupils learn to read at acceptable benchmarks in their early school years in the case study concerning others who have observed the availability of school libraries predicting pupils' ability to learn to read.

In addition, the study assessed the adequacy of classrooms at each school where participants were enrolled. This aspect of the evaluation was based on findings from other studies that indicate that pupils read well or learn better in schools with adequate classrooms and space for teachers to provide reading instruction and remedial support as needed [22]; Benade, 2017). Intentionally including this variable allowed the researchers to assess whether reading interventions should also consider classroom space in addition to a focus on reading instruction.

Further to this, the study assessed the impact of access to water and sanitation on pupils' attendance. This consideration was based on research indicating that the availability of water and sanitary facilities affects the consistent attendance of pupils, particularly girls, in schools [23]. Inconsistent school attendance hinders a pupil's ability to master the reading procedure. This failure is lineal and requires that pupils and teachers follow the script unless remedial classes are arranged to help absent pupils follow through and catch up with the

instruction procedure. Therefore, in this study, the school resource variable was defined by the vector of factors that show how well-resourced the school is and that have been supported in other studies to influence pupils' ability to read or learn in general.

3) Reading instruction behaviors

According to the behaviourist theory of reading, learning is the result of a stimulus, a response and the association between the two. It proposes that learning changes result from the form and frequency of the visual performance by the learner [24]. The theory assumes that learners are responsive to a stimulus and that reinforcement increases the likelihood of a similar response in the future. Practically, the performance based on this theory depends more on consistent practising and less on memorisation by the learners. This theory places the teacher at the centre, with the teacher dispensing knowledge to the learners based on the environment and instructing them to progress from simple to complex tasks. In other words, the teacher takes the learners from direct instruction and gradually supports them to master the skill and knowledge through repeated reading practice and instructional routines.

The behaviourist theory, as described above, reaffirms earlier claims that pupils learn a language from practising teachers' routines. However, this is contingent upon the response to the specific environment. For example, positive reinforcement of learned language results in sound repetitions, implying that pupils acquire the language through imitation [25]. However, the behaviourist theory of learning assumes that learners are passive participants in the process of learning; instead, the environment influences how they learn. This assumption is debatable. It is a well-known fact that children learn a language nearly simultaneously despite growing up in different environments. This fact implies that the domain is not unique to the process, suggesting that additional factors assist language acquisition. Such factors influence how fast the children adapt to the learning process rather than the child's passiveness as proposed by behaviourist theories.

Akech (2017); Adamba (2018), and Afoakwah and Koomson (2021) [26] have pointed out how the environment influences and inspires learning as a concern, stating that the environmental influence is not a universal occurrence; rather, it varies among individuals who are exposed to a particular aspect of the environment. Similar circumstances are eminent in the assumption that there will be a structured adherence to fine-grained instruction that supports remediation from the repeated practice that this theory posits. However, this is uncommon because teachers and others who support the learning process are skilled differently [27]. Therefore, the behaviours that support the learning process would vary regardless of the strict scripting of instruction. Consequently, the learning outcomes of pupils subjected to the delivery of reading instruction are likely to vary and cannot be standard.

Earlier critics of behaviourism have also questioned the assumption that the reading curriculum can script teachers successfully and have them view learners as passive actors in the learning process[28]. Essentially, this assertion considers teachers as inactive in the delivery of instruction, which is contestable since teachers have background knowledge, will always apply it in their teaching routines and may consider conceptual expertise that learners bring along. Others, however, have supported that learning can occur naturally, even without prior knowledge and instruction from teachers, parents, and peers. Such learning makes use of available text, investigation of the text, and efforts to make sense of regularities in a text[29], thus supporting other elements on how learning occurs and the pupils' behaviour. Therefore, behaviourism as a theory cannot fully explain how learning takes place. The aforementioned factors complement other learning theories for optimal reading results in pupils.

The tenets of behaviourism are prominent in the teaching of reading through a phonics-based approach. These tenets are present in the procedural nature of the phonics approach to reading instruction which is, in essence, a bottom-up approach. The bottom-up approach to phonics begins with simple reading tasks and progresses to more complex ones. For example, pupils first name the letters of the alphabet through the teachers' repeated instruction. Second, teachers teach the sounds of the letters, where the teacher models the letter sounds. Thirdly, the teacher says the letter with the pupils, and fourthly, the pupils repeat the sounds by imitating the teacher's pronunciation. Lastly, the pupils are taught letter blends, from simple to complex syllables. Once the pupils internalise the routines, the teacher introduces nonsense words and familiar words before introducing the pupils to short phrases. When pupils can read nonsensical words and phrases, the teachers introduce pupils to short paragraphs and practise reading fluency with the pupils. After that, the teachers work with the pupils, to teach them comprehension strategies they must use to make meaning of the words read in the paragraphs. These are practised repeatedly and assessed based on the number of correct responses from listening to a paragraph being read aloud to the pupils and self-reading (listening and reading comprehension, respectively).

The routines in the reading described above are scripted to ensure implementation fidelity. Teachers are encouraged to rehearse and repeat routine behaviours until the learners internalise the process and can read independently. Notably, this approach involves a series of procedures whose successful implementation depends on the teachers' implementation fidelity. Unfortunately, the implementation of teaching fidelity is not universally uniform [30]. It is also a teacher-centred approach. According to previous research, the success of teachers requires a strict adherence to time on task, which is difficult to attain in overcrowded classrooms [31]. Therefore, the phonics approach to teaching reading may be theoretically sound for instructional design.

Nevertheless, phonics relies on certain assumptions to be effective. For example, the instructional approach alone does not guarantee that pupils will learn reading better; the environment in which the teacher implements the approach must be conducive to the assumptions and doctrines of the approach. These include a low pupil-to-teacher ratio, consistent school attendance by pupils, and learning support provided to pupils after school for continued learning. Therefore, the study assessed the effect that factors such as language a child used at home affected their ability to learn to read, absence or consistent participation in school, the ability of the children to practice reading when at home, presence of bullying or lack thereof in schools and their resultant effects on reading gains that the children were able to sustain to determine what is key and critical in the case study, and therefore, requiring attention by reading instruction programmers to complement efforts that get a child read faster per the context of the study area.

III. STUDY METHODOLOGY

The study adapted a reading test standardized for children with access to a minimum of two years of education. The reading test focused on the ability of children to name letters, sound the letters, read syllables, familiar word reading and reading fluency. The reading test was conducted on 276 children in Lungwena, Mangochi from a population of 840 children who were enrolled into a nutrition intervention from birth for 36 months and all had a minimum of two (2) year equivalent education. At the time the children sat for the reading test, they had an average age of ten (10) years.

The reading test had five essential sub-tasks that were assessed. The parts were determined to be the essential components of the phonics-based reading instruction used by the study's pupils enrolled on the reading curricula. In the first sub-task, random letters were grouped in a box in a random manner. The administrators of reading test asked the pupils to name the letters pointed to them at random intervals of over one minute per pupil. Each letter that the pupil named correctly was marked up. At the end of each administration of the sub-

task, the teacher counted the letters that were named correctly within one minute and recorded the total number of letters read correctly on the reading test sheet under this sub-task.

The second subtask of the reading test involved a section in which the letters of the alphabet were again randomly arranged in a box. The administrators of the reading test instructed pupils to sound out the letters that were randomly pointed out to them. The teachers graded and compiled all letter sounds that were performed correctly. The total score was recorded at the end of the administration for each script. This subtask was also administered for one minute per pupil. Therefore, the test recorded the percentage score of letter sounds per minute.

The third subtask focused on reading fluency. Here, the pupils were given one minute to read the words in the paragraph. The teachers listened to pupils read paragraphs aloud and recorded the correct words each pupil read. The words that were read correctly were marked up to calculate the total score on each test sheet for this test item. The score that a pupil obtained on this test item reflected their reading fluency – the number of correct words that a pupil could read in one minute. The testing of fluency was levelled for two years of education.

The fourth section of the reading test included a subtask on paragraph comprehension. During this subtask, pupils were required to read the paragraph silently within one minute. After reading the paragraph, the pupils were instructed to read the questions derived from the story in the paragraph read and to provide answers to each question. The reading test administrators marked all of the pupils' correct responses. The researcher reviewed and calculated scores on each test sheet that the teachers administered to verify the accuracy of the count. The administration of the reading comprehension test allowed the researchers to determine the reading comprehension ability of the pupils tested.

It is important to note that the subtask of the reading comprehension test did not include pupils who could not read fluently. The basis for this decision was that pupils who were unable to read could also not read and understand the story on their own. Therefore, it was deemed inappropriate to assess these pupils' reading comprehension. Instead, the reading test administrators encouraged and acknowledged the student's efforts, wished them well and gave them a pencil as they disengaged such pupils from the reading test.

The fifth subtask of the reading programme required the pupils to increase their paragraph reading time to a maximum of three minutes. The extension of the reading time gave the pupils more time to read the story and engage with the story. This extended comprehension also gave the pupils more time to search for the answers to the questions based on the story they had just read. The additional time was provided to determine if, given more time, pupils' reading comprehension performance would improve. This subtask was given to pupils who could answer at least one question from the reading comprehension.

The reading test and all subtasks were administered in Chichewa. The administrators of the reading test were practicing teachers selected in the study area. All reading test administrators were familiar with the early-grade reading assessments through the training provided by the researcher. The Administrators marked correct answers as explained above, consolidated the scores on each subtask, and the researcher reviewed and scored each questionnaire to ensure that the aggregated scores per subtask were validated before using the results in the analysis.

Further to the reading test, where the study focus was on examining how the mastery of pre-reading skills relate to the overall ability of the children to read as purposed in reading instruction that follows a phonics approach, the study collected school and pupil data through school observation surveys and a pupil survey to

collect information that could be associated with the ability of the children to learn reading. For the school resources survey, the following data was collected in seventeen (17) schools in the study area.

The pupil survey followed immediately after the reading surveys. After administering the reading test, the administrators sat down with each pupil. They solicited information from pupils regarding their home environment, physical spaces available for reading practices, and reading-related resources or support available to them after school. This survey was administered to determine the impact of these non-homogenous factors on individual pupils' ability to acquire reading skills.

Specifically, the survey asked the pupils to recall the availability of support, text, and other resources in their homes that they use to learn to read at home. The survey was used to collect information from the pupils based on the fact that the average age of the respondents was ten (10) years, which increased confidence in their ability to recall accurately. It was anticipated that responses would differ. Therefore, the pupils' experiences would not be uniform, allowing the study to examine the granular effects that the differences in access to supportive items and resources in homes would have on the pupils' ability to learn to read.

In summary, the purpose of the pupil survey was to “find out additional factors that contributed to pupils' ability to read. For example, pupils were asked how frequently they practice reading with peers or parents after school. In addition, they were asked how many times they eat per day, and the number of days they were absent from school in a month was verified by assessing the available up-to-date attendance register. The pupils were also asked to indicate the textbooks they have access to at home and the frequency with which their teachers assign reading homework. The collected data supplemented the explanation of factors contributing to reading by examining the variation of results per pupil-level factors

The school resources survey consisted of a checklist of key resources available in primary schools where the selected pupils were enrolled. The survey administrators used the observation checklist to record the number of classrooms at each school. The observation checklist captured a number of factors, including the availability of texts in classrooms, libraries, textbooks, classroom lighting, safe spaces free of bullying practices, and the positive reinforcement methodologies employed by teachers in their lessons

To analyse the data collected from the reading test and the surveys mentioned above, the number of correct letters named, sounded and syllables read per minute were recorded for each child who participated in the reading test. Further correct words read per minute were also recorded for each child, and scores on each subtask were recorded for each child. Immediately after the reading test, the school resources data and the pupil specific data mentioned above were also recorded. In order to assess the effect each of these variables had on the reading ability of the children, the study used a generalised structural equation modelling to test the association of the variables on the oral reading fluency ability of the children in the study area as defined in figure 1 below:

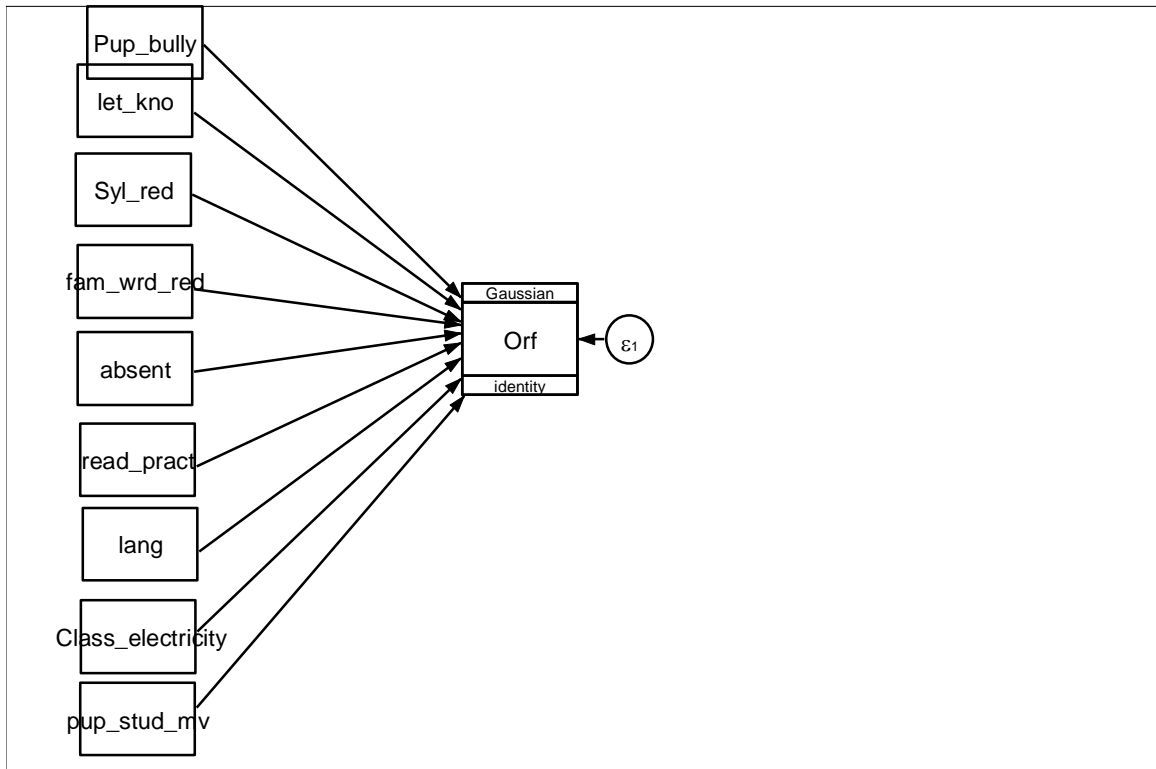


Figure 1: Structural equation model for explaining variations in factors that affect students reading abilities

The variables in Figure 1 above are further described in Table 1 below:

Table 1: structural equation model variable definition

Variable	Definition of variable	Unit of measurement
Reading practice by pupils in homes (Read_pract)	This variable represented the study with responses from the pupils regarding whether or not they practiced reading alone or with peers after school.	Times a pupil practiced reading at home
Oral reading fluency (Orf)	This variable represented oral reading fluency, which was measured by the number of words each pupil was able to read in one minute following a Reading passage/paragraph that was provided in the reading test, and which included sensical words – words that the pupils could make meaning from their reading.	Number of correct words read by a pupil per minute
Presence of bullying in schools (Pup_bully)	This represented individual pupil responses regarding the experiences and prevalence of bullying at their respective schools, which may have made them fearful of attending and participating in school processes, such as the reading classroom instruction provided by the teachers trained to deliver the reading curricula.	Presence of bullying in schools

Variable	Definition of variable	Unit of measurement
Presence of electricity at a school (Class_electricity)	This variable responds to whether the school where the children were enrolled had electricity on not	Availability of electricity at the school
Language (Lang)	Language that a child used at home	Language of play
Learning environment (Pup_stud_mv)	This referred to the observations and recordings regarding the nature of the school environment, including whether the pupils were motivated to learn as a result of the environment and physical resources that attracted and increased their attention span to acquire reading skills.	Conducive school environment for pupils to learn
School participation (absent)	Number of times a child was absent from school	School attendance
Letter Knowledge (let_know)	Ability of the children to name the letters randomly arranged and pointed to them by the assessor	Number of letters named correctly by the children in a minute
Syllable reading (syl-red)	Ability of children to read word syllables pointed to them at random by assessors.	Number of syllables read correctly in a minute
Familiar word reading (Fam_wrd_red)	Number of familiar words read per minute by the children who took the reading test	Number of familiar words read correctly in a minute by the children

IV. DISCUSSION OF RESULTS

Based on the structural regression analysis, four key factors come out clear as determinants that explain the variation of the ability of children to read in the study area. As presented in the table below, presence of bullying in schools where the children were enrolled reduced the ability of children to read by a factor of 14 ($|z|= 0.012$) at 95% confidence interval. This implies that children who enrolled in schools where there was no bullying, read 14 times better than their counterparts that were subjected to bullying. Similarly, children that were given an opportunity to practice reading in homes and were supported to do so read 12 times more than children that did not practice reading ($|z|= 0$), and statistically significant with 95% confidence level. In terms of the reading instruction practices, the results showed that mastery of word syllables and ability to read familiar words by the children predicted their enhanced ability to read by a factor of 0.33 ($|z|= 0.006$) and 0.73 ($|z|=0$) respectively, and both were statistically significant at 95% confidence level. Furthermore, the language that students spoke at home, when equivalent to the language used in schools, had a better chance at reading fluency by a factor of 5.4 compared to children who used a different language at home and another one in school. This result was statistically significant ($|z|= 0.047$) at 95% confidence level.

The study results showed surprising association of mastery of letter knowledge and ability to read fluently, where the association was found statistically insignificant ($|z|=0.971$) at 95% confidence level. This disputed evidence from theory behind the phonics instruction that has routines on letter knowledge as a key step in learning to read. However, in the case of the study, it did not significantly explain the variation in the reading ability of the children. Probably, the result suggests a confirmation that letter knowledge is necessary but it is a lower-level skill to predict ability of children to read fluently, therefore confirming that focus and emphasis on syllable reading and segmentation, and routine reading practice on familiar word reading is essential in teaching children reading. Similarly, in the case of the study area, school resources such as access to electricity, learning environment and child school attendance did not explain the variation

in the performance of the children in reading fluency with statistical significance at 95% confidence interval. The availability of electricity was non responsive, since all schools that were sampled did not have access to electricity, whereas the children who had access to a better learning environment could read better by a factor of 7.75, despite the fact that if taken together with the rest of the factor under scrutiny in this study, a better learning environment did not explain the variation in reading fluency scores with statistical significance ($|z|=0.454$), similar to child school participation, with a factor of -1.01, and $|z| = 0.231$ at 95% significance level.

Table 2: Results from the structural regression analysis

Iteration 0: log likelihood = -1213.8732
 Iteration 1: log likelihood = -1213.8732

Generalized structural equation model Number of obs = 276
 Response : Orf
 Family : Gaussian
 Link : identity
 Log likelihood = -1213.8732

	Coef.	Std. Err.	z	z	P>z	[95% Conf. Interval
Orf <-						
let_kno	0.0030981	0.084103	0.04	0.971	-0.16174	0.167938
Syl_red	0.3378521***	0.12208	2.77	0.006	0.09858	0.577124
fam_wrd_red	0.7348571***	0.1002	7.33	0	0.538469	0.931245
absent	-1.011926	0.845075	-1.2	0.231	-2.66824	0.644391
read_pract	12.00518***	3.181731	3.77	0	5.769103	18.24126
lang	-5.45049***	2.744033	-1.99	0.047	-10.8287	-0.07228
Class_electricity	0	(omitted)				
pup_stud_mv	7.751554	10.36291	0.75	0.454	-12.5594	28.06248
Pup_bully	-13.83534***	5.496315	-2.52	0.012	-24.6079	-3.06276
_cons	3.190842	4.684615	0.68	0.496	-5.99083	12.37252
var(e.Orf)	386.9539	32.9397			327.4916	457.2127

V. CONCLUSION

The study set out to find and determine key issues that explains the variation of children's reading abilities and offer policy alternatives in the design of reading interventions that aim at maximizing reading gains. The results have shown that issues on language of use at home, consistent reading practice, reduction of children bullying in schools and increased focus and concentration on reading instructional routines on syllable reading and familiar word reading are key to getting children read faster and at sustainable levels, especially in cases where the children have access to a homogenous school environment and resources. Therefore, the study offers an opportunity for designers of reading programmes to apply the designs based on the context and resource the programme on issues that affect the variation on the Childrens' ability to read for sustainable reading gains.

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