

THE EFFECTS OF A ‘CATCH-UP’ READING INTERVENTION FOR GRADE 5 LEARNERS AND TEACHERS

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ABSTRACT

This article reports on the effectiveness of a reading comprehension intervention that was implemented in Namibia. It aimed to empower teachers with knowledge and strategies for teaching reading comprehension, so as to improve the low reading comprehension of Grade 5 learners. The intervention targeted the improvement of performance in both the decoding and comprehension aspects of reading and was carried out during two school terms, in which teachers were provided with teaching and learning resources, guidance on how to utilise the resources and coaching on instructional practices. The study involved two control and two intervention schools. A modest interventionist approach was applied in which four of the six quality criteria for formative assessment of intervention programmes, as proposed by Nieveen (2007) were adopted to guide the study. Analysis of the pre- and post-intervention scores for the intervention and control groups indicated larger effect sizes in decoding ability and reading comprehension at the intervention schools than at the control schools. The intervention teachers also seemed to have changed some of their instructional practices and some shifts in their attitudes towards teaching reading were discerned. The findings suggest that better quality teaching and learning can happen if teachers receive ongoing support to enhance their instructional practices. With effective reading instructional practices, learners’ decoding skills are developed, resulting in improved reading comprehension levels.

KEYWORDS: Decoding, reading comprehension, reading intervention, explicit instruction, teachers’ attitudes

INTRODUCTION

The Namibian government spends the largest share of its national budget on education, an average of over 8% of its gross domestic product (GDP) (UNICEF, 2020). The global average expenditure on education across countries is 4.4% of the GDP (UNESCO Institute for Statistics, 2020). Lewin (2020) estimates that 6% of GDP expenditure on education is needed for low-income countries to enable them to provide more equitable basic education. According to these indices, Namibia’s education budget is higher than both the global average and Lewin’s recommendation.

However, despite the high expenditure on education, learner performance is still low and many Namibian learners go through the primary phase (Pre-Primary–Grade 7) with weak reading ability which, in turn, is associated with poor academic performance (SACMEQ¹ II, 2005 & SACMEQ III, 2010; Töttemeyer, 2010; Shigwedha, Nakashole, Auala, Amakutuwa & Ailonga, 2017). Weak academic performance continues through high school; only about 50% of Grade 10 learners gain admission to Grade 11 and less than 50% of Grade 12 learners qualify for university admission each year. The 2019 education statistics show that the pass rates in core subjects (i.e., English, science and mathematics) are low at 55% in Grade 7 and drop to 40% in the senior secondary phase (UNICEF, 2020). Since literacy, specifically reading literacy, is the foundation for learning, learners cannot succeed in schooling and progress to university if they have low literacy levels (O’Sullivan, 2002; Pretorius & Currin, 2010; Hernandez, 2011; Graham & Kelly, 2018).

In order to improve school achievement, the reading abilities of learners need to improve throughout the schooling system. Ensuring that learners can understand what they read is thus an instructional imperative. Learning to read involves mastering the technicalities of the written code (usually an alphabetic code, as in the Namibian languages) to decipher (or decode) the encoded text message and understand the information in the text. These skills should be taught thoroughly from Grade 1. However, what happens if children in upper primary school (e.g., Grade 5) still struggle to comprehend the texts they read? How can they best be supported?

After four years of schooling, it is generally assumed that learners have mastered the technical aspects of reading (decoding), so fine-tuning the ‘wobbly’ comprehension aspects of reading in Grade 5 should enable learners to improve their reading abilities. Indeed, since the 1980s, there has been a body of research suggesting that explicitly teaching children *how* to comprehend texts by using various strategies that help them to engage more deeply with the text and monitor their understanding can improve reading comprehension levels (National Reading Panel, 2000; Almasi & Hart, 2011; Pretorius & Murray, 2019). Much of this research has been done with teachers and learners in upper primary school (Wassenburg, Bos, De Koning & Van der Schoot, 2015), middle school and high school (Johnson & Zabucky, 2011) in high-income western countries. However, caution is needed when considering interventions that are developed in one specific context and applying them in different contexts (O’Sullivan, 2002; Nieveen, 2007). Therefore, this study was carried out to develop, implement and evaluate a context-based reading comprehension intervention in the Namibian educational context (Liswaniso, 2021). Unlike most reading comprehension programmes intended for middle primary school learners, this one included a decoding component too. The rationale for this broader kind of intervention is explained below.

This paper reports on the summative evaluation or ‘actual effectiveness’, as Nieveen (2007) frames it, of the reading intervention study that was carried out in two intervention schools for two terms from June to October 2019. The article will first briefly describe the theoretical

¹ The Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ) assessments test reading and mathematics skills at Grade 6 level.

framework that underpins the reading intervention, consider broader teacher-based factors in an African schooling context, introduce the research questions, describe the methodology used and lastly, present and discuss the results.

THEORETICAL FRAMEWORKS: DECODING, READING COMPREHENSION, AND READING INSTRUCTION IN CONTEXT

In her study, O’Sullivan (2002) cautions against importing pedagogical models wholesale into contexts for which they were not originally intended without first considering the new context. In a similar vein, Nieveen (2007) proposes a methodological framework where six quality criteria are applied in successive stages for formative assessment of intervention programmes in specific contexts. Bearing in mind the aphorism that context matters in research, in this section, the theoretical models that underpin the research reported in this study are briefly outlined in relation to the Namibian education context.

Decoding and reading comprehension

Reading is not a unitary phenomenon; instead, it is complex, involving various code, language, neurological, cognitive and socio-affective factors that gradually become seamlessly interwoven as skill in reading develops (Dehaene, 2009; Seidenberg, 2017; Castles, Rastle & Nation, 2018). Alphabetic writing systems (such as English) represent spoken language at the phonological level. While comprehension is the goal of reading, it relies on decoding skills which is the ability to recognise the written code by corresponding letters to their sounds systematically (Wren, 2001). For unskilled readers, decoding is a slow and laborious process and demands cognitive attention and energy, whereas for skilled readers, it is fast and effortless (Pretorius & Murray, 2019). The fast and accurate decoding process is thus seen as a prerequisite for comprehension across all alphabetic writing systems (Castles et al., 2018) but decoding on its own is not sufficient to guarantee reading comprehension (Guldenoğlu, Kargin & Miller, 2012). Decoding skills (e.g., letter-sound knowledge and rapid word reading ability) are critical in learning to read and subsequently, in reading and accessing the meanings of individual words in a text. The National Reading Panel (2000) has shown the value of explicitly teaching decoding, especially in early grades when children learn to read.

Oral reading fluency (ORF) refers to ‘the ability to read rapidly with ease and accuracy, to read with appropriate expression and phrasing. It involves a long incremental process and text comprehension is the expected outcome’ (Grabe, 2009: 291). ORF relies on high levels of letter-sound knowledge and strong word reading skills and is regarded as a bridge between decoding and reading comprehension. This is because it correlates strongly with both word reading (Liswaniso, 2021) and reading comprehension (Pretorius & Lephalala, 2011; Jimerson, Hong, Stage & Gerber, 2013; Pretorius & Spaul, 2016).

The main features of reading fluency are accuracy, speed (or rate) of reading and intonation, with accuracy developing first to support oral reading speed. This kind of reading sounds similar to spoken language (cf. Pretorius & Spaul, 2016). The reason why fluency is regarded as playing a critical role in reading comprehension is that automaticity and speed in word

identification free up working memory so the reader can concentrate on comprehension aspects of reading (Castles et al., 2018).

Fluency can be supported by familiarity with the vocabulary used in the text. For example, Grade 5 learners may be able to read a text comprising high frequency (or common) words at the 1,000–3,000-word frequency level with ease but a text with low frequency and academic words can be quite challenging for them to read and can slow down their fluency. For non-fluent readers, such texts are even more challenging.

ORF is measured by words correct per minute (WCPM) (Hasbrouck & Tindal, 2006). As learners move up the grades and their reading skills improve, their reading becomes faster and more accurate as reflected in WCPM. Thus, by the end of Grade 3, a reader at the 50th percentile can read around 107 WCPM while a Grade 5 reader at the 50th percentile can read around 139 WCPM (Hasbrouck & Tindal, 2006). A relationship between fluency and reading comprehension exists in both English as a first language (L1) and English as a second language (ESL) (Grabe, 2010; Pretorius & Spaul, 2016). Research shows that there is a fairly strong relationship between fluency and reading comprehension in ESL, with correlations ranging between .49 (Draper & Spaul, 2015) and .80 (Pretorius & Lephala, 2011).

In intermediate phase classrooms, reading comprehension is typically assigned a slot in the English language timetable. During such lessons, teachers often get readers to take turns reading a text (in round-robin fashion) and afterwards, learners answer questions on the text either orally or in writing. Although teachers might think that they are teaching comprehension, they are usually getting their learners to ‘do’ comprehension (Pretorius & Klapwijk, 2016). Nevertheless, research on reading has shown that comprehension can be improved through explicit instruction, for example, by teaching strategies for vocabulary building, recognising text structure, activating prior knowledge, making inferences and predictions, and monitoring comprehension (Almasi & Hart, 2011).

In the study reported in this article, the main aim was to design an intervention that focused on improving reading comprehension. Although basic decoding skills are typically mastered by the time learners progress to the intermediate primary school phase, in a low-income developing country such as Namibia, one cannot assume that such skills are already in place. In fact, Namibian research suggests that foundational literacy skills develop slowly, as shown by studies with Grade 1 Afrikaans learners (February, 2018) and Grade 1–2s learning to read in Oshikwanyama (Nghikembua, 2020). Thus, the intervention also included a decoding component, where both the decoding and reading comprehension abilities of Grade 5 readers were assessed and activities were designed to improve performance in both areas.

Teacher change models

Although many factors are involved in reading development and academic success, school success is largely determined by the quality of teaching (World Bank, 2018). As Chong and Ho (2009) argue, teacher quality affects learning outcomes. Effective teacher instruction is therefore a critical component of school success in developing countries (cf. Kim, Boyle,

Zuilkowski & Nakamura, 2016). To realise the goal of academic success for all learners, teachers need to be empowered to increase the effectiveness of their instructional practices (Hattie, 2015a). When learners have low literacy levels, change should begin in classrooms with teachers providing effective literacy practices. Thus, an intervention is needed that will provide teachers with the necessary support to improve the quality of the way that they teach reading and how they support their learners' reading development.

However, simply telling teachers to change their instructional practices does not magically bring about change. Once teachers are in their classrooms, it is difficult to change their classroom behaviour and changes happen slowly (Guskey, 2002). In the Namibian context, O'Sullivan (2002) found that ESL teachers were not implementing the new English syllabus because of, inter alia, limited content and pedagogical knowledge. Both February (2018) and Nghikembua (2020) found that teachers lacked knowledge about reading and its effective instruction. From the above, it is clear that teacher change needs to happen in terms of content knowledge, pedagogical knowledge and attitudes. The sequence of change depends on the change model or theory one applies. Even if the Ministry of Education tried to fix school infrastructure, reduce class size and provide more teaching and learning resources, academic progress may still be minimal if teachers continue teaching in less effective ways (Hattie, 2015b). Since the current study is an intervention to improve reading outcomes that focuses specifically on developing teacher capacity in reading instruction, we touch on two theories of change, namely Guskey's (1986, 2002) theory of teacher change (Figure 1) and the integrative model of behaviour prediction by Fishbein (2000) (Figure 2) as they underpin the approach in this study.

Guskey's (2002) model, originally published in 1986, predicts a specific sequence of changes in teachers. It starts with teachers being introduced to new teaching practices (i.e., pedagogical knowledge) and ends with the teachers changing their beliefs and attitudes because of the positive learning outcomes observed in their learners as a result of their changed practices. For teachers to change classroom practices, their professional development should include coaching them on how to teach effectively, working with each other and using available resources to improve their teaching.

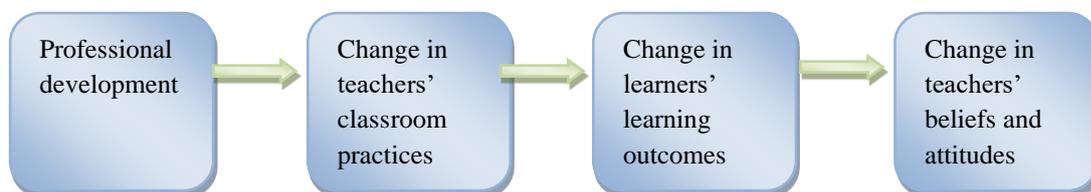


Figure 1: Model of teacher change. Adapted from Guskey (2002: 383)

However, whether or not teachers change their teaching practices depends on many factors, including the intention to change. The integrative model of behaviour prediction model was originally proposed by Fishbein (2000) to assist in programmes for HIV/AIDS prevention, where participants found it difficult to change their behaviour, even when faced with a life-challenging disease. The model can also be applied in educational contexts to predict behaviour

change in classrooms and identify determinants of behaviour change. According to this model, intention is considered to be the primary determinant of behavioural change. The intention to do something (i.e., change one's way of doing things) is determined by three major factors, namely attitude, norms (prevailing ways of thinking and doing) and self-efficacy (confidence in one's ability to do something) (Fishbein, Hennessy, Yzer & Douglas, 2003). The integrative model of behaviour prediction recognises that people act on their intentions if they have skills or ability (e.g., content or pedagogical knowledge in the schooling context) and if there are no normative or environmental constraints that make it difficult for them to change (Fishbein et al., 2003). When this model is applied in the schooling context, teachers can become effective literacy instructors if their skills to teach reading are developed and their school environment acts as an enabler in supporting reading development. Additionally, giving teachers sufficient resources such as lesson plans and texts minimises environmental constraints and helps to support changes in normative behaviour. Figure 2 shows a simplified integrative model of behaviour prediction.

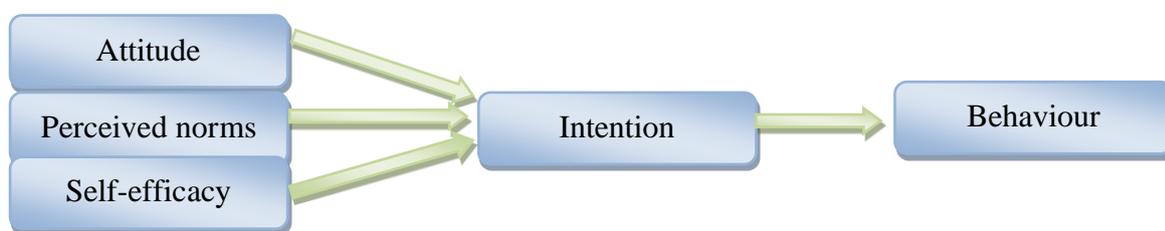


Figure 2: Integrative model of behaviour prediction (Pretorius & Knoetze, 2013: 31)

Figure 2 shows that teachers change their behaviour or instructional practices only when they have the intention to do so. The intention to change is influenced by a combination of factors such as the teachers' attitudes towards an instructional practice, based on their experience and/or content and pedagogical knowledge, perceived literacy norms and teachers' feelings of self-efficacy regarding their ability to provide effective reading instruction (cf. Pretorius & Knoetze, 2013).

It was within this broader theoretical framework that the reading intervention programme was conceptualised and designed. The objective of this article is twofold. First, using quantitative learner assessment data, we examine whether the learners' decoding and reading comprehension skills improved as a result of the intervention. Second, using qualitative interview data, we explore whether the intervention had an impact on the teachers in the intervention schools in terms of changed classroom practices and teaching reading.

1. *How did the reading comprehension intervention affect Grade 5 learners' decoding and reading comprehension levels?*
2. *How did the reading comprehension intervention affect teachers' attitudes and practices towards the teaching of reading comprehension to Grade 5 learners?*

The research questions enable us to examine the efficacy of the reading intervention. Based on the findings, we then draw implications for primary school literacy instruction in similar educational contexts.

RESEARCH METHODOLOGY

A quasi-experimental design was used for the intervention, involving intact Grade 5 classes from two control and two intervention schools in Namibia. A mixed-methods design was applied in which both qualitative and quantitative data were collected to inform the intervention process. The quantitative data involved pre- and post-assessments of the learners' decoding and reading comprehension skills while the qualitative data involved interviews and discussions with teachers after the intervention.

Participants and sampling

The participants comprised Grade 5 learners and their English teachers in four schools in Katima Mulilo. There were two intervention and two control schools, which were assigned randomly to the treatment or control conditions. The test responses of 353 learners (364 in pretests and 353 in the posttests) and the interview responses of two intervention teachers are reported in this article. In the final analysis of data, only learners who wrote both the pretests and the posttests were included. Although there were more than two Grade 5 classes in each school, only two Grade 5 classes per school were selected to participate in the study (i.e., Grade 5A and 5B classes were selected from each school). Although learners come from different socioeconomic backgrounds, most of them were from low socioeconomic backgrounds across all the schools.

The intervention programme

The intervention involved the following features:

- The intervention teachers used a *Teachers' Guide* with scripted lesson plans (Piper & Korda, 2011) which was designed by the main author with the support of experts and the teachers (the iterative process in designing the guide is reported in Liswaniso, 2021).
- The intervention comprised 32 lesson plans to be followed over two terms. The first six lessons focused on improving accuracy and fluency in reading as a basis for comprehension, six focused on vocabulary learning strategies and 17 focused on reading comprehension strategies.
- Teacher capacity-building and making reading and teaching materials readily accessible to learners and teachers were integral to the programme.
- Regular mini-workshops were held with intervention teachers to enhance their content and pedagogical knowledge about reading (i.e., what reading entails and how to teach it).
- The researcher (main author) coached the intervention teachers on reading instructional practices.

Data collection instruments and procedures

To evaluate the effectiveness of the intervention, pre- and post-intervention assessments and teacher interviews were administered. The instruments were piloted before being used in the main study. The pretests were administered in January and February 2019 before the intervention and the same tests (posttests) were given in October and November 2019 after the intervention. The instruments are briefly described below, following the order in which they were administered.

Two subtests were used to assess decoding skills, namely an out-of-context word recognition test, using the Burt word reading test (BWRT) and a contextual ORF test.

BWRT: This instrument was used to establish learners' accuracy in word recognition ability. The BWRT is an untimed test that comprises 110 words, arranged in decreasing font size and increasing word length and difficulty; it starts with short, common, high-frequency words (it includes sight and decodable words) which then decrease in frequency levels and increase in length. The test is administered to learners individually (one-on-one). Each learner is required to read the words on the card orally (from left to right) until the learner has read 10 consecutive words incorrectly. The words that have been read correctly are then counted and converted into a reading age (in years and months) using the BWRT table. The test has been standardised on home language English readers and reading age norms have been derived from it.

ORF test: This is used to assess learners' fluency levels when reading words in context (Wright, 2013; Nation, 2009; Hasbrouck & Tindal, 2006). This is an assessment where individual learners are asked to read an unpractised grade-level prose text aloud for one minute (Hasbrouck & Tindal, 2006). The number of errors made while reading is then subtracted from the total number of words read in a minute, giving a score of correct words read per minute (WCPM) for each learner. The ORF text comprised 187 words and none of the participating learners managed to read the whole passage.

To ensure that the texts used in the assessment were appropriate for L2 Grade 5 readers, the Flesch–Kincaid readability test (available in *Word*) was applied to test the difficulty or ease level of the texts. The high Flesch reading ease score (of 87.3) in the ORF text indicated that it is equivalent to a Grade 3 text in the US. In the Namibian context, the text is suitable for Grade 4 and 5 learners since English L2 learners learn to read a bit later than native speakers. Furthermore, most of the words in the text (95%) comprised high-frequency words within the 1,000–2,000-word frequency levels which should be familiar to Grade 5 learners.

Reading comprehension test: The reading comprehension test comprised one narrative (Text A) and two information texts (Texts B and C). Text A was a narrative text about how the San in Southern Africa used to hunt and gather their food. Text B was an information text about a San boy in which the nomadic life of the boy and his family is described (both these topics are not unfamiliar to Namibian learners). Texts A and B were adapted from the large-scale South African NEEDU Grade 5 study (reported in Draper & Spaul, 2014; Pretorius & Spaul, 2016). Text C was an information text (taken from PIRLS) about doing experiments to establish how

small creatures like ants, pill bugs and worms find their food. All three texts included questions of varying cognitive difficulty (i.e., literal, inferential and evaluative questions) as well as different question formats such as multiple choice and creative responses (i.e., open-ended) questions. The items from the three texts formed a composite score for the reading comprehension test.

Teacher interviews: Semi-structured interviews (face-to-face) were used so that teachers could provide additional information if needed and for the researcher to probe some details. When the teachers were interviewed after the intervention, the learner data had not yet been analysed. The interview was first transcribed and then several iterations of content analysis were done. The responses to the questions posed during the interviews provided information from which themes were derived relating to changes in attitudes, perceived norms and feelings of self-efficacy about reading.

RESULTS AND FINDINGS

Before reporting on the outcomes, it must be pointed out that although there was fairly good fidelity to the intervention in terms of following the lesson sequence and each lesson plan (Liswaniso, 2021), only 20 of the original 32 lessons (a third) designed to support development in fluency, vocabulary and reading comprehension were actually implemented during the two school terms of the intervention, viz. six lessons on building fluency skills, six lessons on vocabulary strategies and eight of the remaining 17 lessons on reading comprehension strategies. Accordingly, outcomes are reviewed in light of the incomplete application of the intervention (the reasons of which are discussed below).

Quantitative data presentation: Learners' performance

The decoding and reading comprehension results of 306² learners comprising 163 girls and 143 boys, with a mean age of 11.3, towards the end of the year (October) were analysed from the pre- and post-intervention assessments. Cronbach's alpha reliability coefficient values for the BWRT and the reading comprehension test in the posttest were high, at .96 and .82, respectively. The Kolmogorov-Smirnov test showed that data for the schools did not follow a normal distribution, therefore, non-parametric tests were used for the inferential statistical analysis.

Research Question 1: *How did the intervention affect Grade 5 learners' decoding and reading comprehension levels?*

The effect of the intervention was evaluated in terms of the learners' performance in word recognition, ORF and reading comprehension across the control and intervention groups, from pre- to posttests. The results of the learners' decoding skills are examined first, followed by the reading comprehension results.

² Although 353 learners were tested for the post-intervention, only 306 learners who were assessed both times were included in the data analysis.

Decoding skills: Word recognition and ORF

The descriptive statistics in Table 1 show the overall means and standard deviations for the combined control and intervention schools for word reading (raw score out of 110 items) and ORF (as measured by WCPM), while the means at the 25th, 50th and 75th percentiles show how differentiated performance was spread across the weaker, average and better readers.

Table 1: Word reading and ORF scores for the control and intervention schools

Pre-intervention	January/February 2019			Post-intervention October/November 2019				
	Mean	SD	Min-Max	Mean	SD	Min. Max.	Mean gains	Effect size: Cohen's <i>d</i>
Word reading								
Control (n=149)	41.3	16.1	9-84	45.9	17.2	15-91	4.6	0.27
Percentiles:	25 th	29		32			3	
	50 th	38		42			4	
	75 th	51		58			7	
Intervention(n=157)	39.4	21.0	1-90	49.7	22.2	7-98	10.3	0.47
Percentiles:	25 th	26		35			9	
	50 th	36		46			10	
	75 th	49		70			21	
ORF WCPM								
Control (n=149)	45.1	25.6	0-118	51.8	27.8	0-149	6.7	0.25
Percentiles:	25 th	25		32			7	
	50 th	41		47			6	
	75 th	60		67			7	
Intervention(n=157)	41.8	30.7	0-135	57.5	36.1	0-165	15.7	0.46
Percentiles:	25 th	18		32			14	
	50 th	37		55			18	
	75 th	62		76			14	

As Table 1 shows, there were generally low decoding scores at pre-intervention time across all schools. Learners in the intervention schools improved their mean word recognition with an increase of 10.3 words, more than twice that of those in the control schools. Before the intervention, the control schools had, at face value, a slight advantage in word reading and ORF but after the intervention, the intervention schools performed better than the control schools. The percentiles show that the control and intervention schools' best performing cohorts at the 75th percentiles had slightly similar performance in word recognition before the intervention commenced. However, the post-intervention scores show a widening gap between the best performing cohorts, with those in the intervention schools showing an advantage over their peers in the control schools.

ORF also improved in the intervention schools by an average of 15.7 WCPM whereas the control schools showed an average increase of only 6.7 WCPM.

A Mann-Whitney test for independent samples showed that there was not a statistically significant difference between the pre- and post-intervention word reading scores ($U = 10853.500, p = .276$) and post-intervention times ($U = 10229.000, p = .105$). This is perhaps not surprising, given the wide variation in performance in both control and intervention groups. However, since the intervention schools started from a slightly lower decoding base, the Wilcoxon matched-pairs test was used to test for significant differences between the pre-intervention and post-intervention scores of the two groups. The results showed that the pre- and post-intervention results for the control group were not statistically different ($Z = -1.076, p = .282$). However, there was a statistically significant difference between the pre- and post-intervention scores of the intervention group ($Z = -2.104, p = .035$), suggesting that the intervention had a significantly positive effect on the learners' word recognition skills.

A Mann-Whitney test for independent samples was also applied to test for significant differences in ORF between the control and the intervention groups. Here too, the ORF scores between the groups were not statistically different in both the pre-intervention and post-intervention tests. However, the intervention schools started from a much lower ORF base than the control schools, with 11 learners scoring zero in the ORF assessment at pre-test time. The Wilcoxon matched pairs test results showed the ORF posttest results were significantly higher than the pre-test results for the intervention group ($Z = -2.012, p = .044$) but not for the control group ($Z = -.970, p = .332$). As in the word reading scores, since only learners from the intervention schools improved significantly on the ORF, the intervention seems to have brought about improved fluency results.

Further support for the impact of the intervention on word recognition and ORF is seen in the effect sizes of the two groups. Using Cohen's d to measure effect size, an intervention may be considered to have a small impact if effect size $d = 0.2$, a medium effect if $d = 0.4$ and a large effect if $d = 0.6$ (Hattie, 2009). Following this measure, the post-intervention results show a small effect size for the control group and a medium effect size for the intervention group for both word reading and ORF.

Despite learners attending school for the whole academic year, some of them were still not able to read—even at the end of Grade 5. In the pre-intervention assessment, two learners in the control schools and 11 learners in the intervention schools were not able to read at all. Interestingly, in the posttest, the intervention schools reduced the number of learners who could not read to two. This suggests that struggling readers in the intervention schools had reading opportunities and assistance that helped them to improve their reading skills.

Reading comprehension

Table 2 provides the overall reading comprehension scores in percentages and also disaggregates performance in terms of literal and inferential comprehension scores for the control and intervention groups in the reading comprehension test.

Table 2: Reading comprehension scores for the control and intervention schools

	Pre-intervention, February 2019			Post-intervention, November 2019				
	Mean %	SD	Min. - Max.	Mean %	SD	Min.- Max. %	Mean % gains	Effect size: Cohen's <i>d</i>
Control								
Total score	18.5	11.2	3-55	24.5	13.9	3-66	6	0.47
Literal	25.0	17.5	0-75	32.8	22.4	0-100	7.8	0.38
Inferential	15.8	9.7	0-46	20.6	11.8	0-58	4.8	0.44
Percentiles:25 th	10.5			13.1				
50 th	15.7			21.0				
75 th	23.6			31.5				
Intervention								
Total score	18.2	11.0	0-53	26.5	15.2	3-82	8.3	0.62
Literal	25.6	18.0	0-83	36.4	21.6	0-83	10.8	0.54
inferential	14.8	9.5	0-46	21.9	14.2	0-81	7.1	0.58
Percentiles:25 th	10.5			15.8				
50 th	15.7			23.6				
75 th	23.6			36.8				

Table 2 shows that the two groups' scores matched fairly evenly in the pretest but in the posttest, the intervention group improved their reading comprehension (mean gain of 8.3%) slightly more than the control group (mean gain of 6%). While a Mann-Whitney test for independent samples showed no statistically significant differences between the control and intervention groups at pre-intervention and post-intervention times, the matched pairs Wilcoxon test showed significant differences between pre- and posttest results for both control and intervention groups ($Z = -2.174, p = .030$ and $Z = -2.896, p = .004$), respectively. However, the intervention group showed a larger overall effect size ($d = 0.62$) than the control schools (0.47), with strong effect sizes in improvement in performance on both literal and inferential types of questions.

Using Spearman's rho correlation, robust relationships between decoding and reading comprehension were obtained. The correlation between word recognition and reading comprehension was .70 and between ORF and reading comprehension it was .73, while a correlation of .88 was obtained between word reading and ORF.

Qualitative findings: Teacher interviews

The intervention teachers were interviewed after the intervention had ended. The qualitative component of this study sought to address Research Question 2: *How did the reading comprehension intervention affect teachers' attitudes and practices towards the teaching of reading comprehension to Grade 5 learners?* Although several findings emerged from this aspect of the study, space permits only those pertaining to teacher attitudes and classroom practices to be reported in this article.

The first theme that emerged from the interviews with teachers was the **positive response to reading and lessons among learners** noticed by the teachers. This theme involves three aspects, namely increased learner participation, changes in attitudes towards reading and learners enjoying the lessons. Both teachers portrayed their learners' participation in the reading lessons in positive terms and indicated that they noticed some positive changes towards reading, for example:

Teacher 3: What I noticed is that the learners improved much on focus and concentration. I don't know; maybe it's because the lessons were different compared to the ones that we normally have. Because each time they have a reading lesson, for instance, everyone seems to have time and energy to an extent that they even beg me to have a reading lesson instead of what was scheduled for that day.

Teacher 7: I realised that during and after the intervention when I come in (sic) class, I find that almost every learner, if not all of them, most of them, are busy taking newspapers and some different books. Some will even show me that 'see the book, my mom bought the book. See the book my dad bought for me'. Some would come to me and say I have to escort them to the library to borrow books because they are scared of the teachers who are there. Then I realised that these learners are developing the reading culture. I realised that this intervention is like it's really helping these learners.

These statements suggest that the intervention developed a greater interest in reading among the participating learners. Their interest in reading may have developed because of the fluency component of the intervention that may have helped them to improve their reading rates making reading less effortful, thereby facilitating the 'pleasure' reading that the learners were required to do every day.

The enjoyment aspect is supported by the teachers' responses that showed that the learners enjoyed their reading lessons. For example:

Teacher 3: They did enjoy and they followed because I could see that even those that needed more help in reading—their attitude changed. They became more willing to read. Some could take a passage from any story just to read it. But when you give them a different text to read, you see that some are struggling, but the one that they have put much effort on [the text they practised in class] they won't struggle. For me, it means they are trying to work out something when it comes to reading.

Teacher 3's remarks suggest that even poor readers' reading attitudes changed, as they enjoyed re-reading the texts with which they were familiar. This reading enjoyment comes with feelings of self-efficacy. The fluency activities seemed to have helped them decode slightly better, which then gave them a feeling of being able to manage reading better.

Another aspect that emerged was differentiated benefits, with some learners benefiting less from the intervention lessons than others. Although the teachers felt that the learners had developed positive reading attitudes, their learners' progress in reading required some probing. Both teachers seemed to think that their good readers benefitted more from reading instructions than the weak readers (as also reported by McCormick, 1995). Learners (including the struggling readers) were trying their best to do the reading activities. However, the struggling readers still needed more time to catch up with their peers. Based on the understanding that poor readers need more time to catch up, the teachers indicated that during the next academic year, they would apply the new reading approach right from the beginning of the academic year, as outlined in the *Teachers' Guide*, so that all their learners could benefit from the lessons.

The last aspect of this theme that emerged during the interviews was about teachers facing obstacles in carrying out the intervention. Here, the researchers were interested in the teachers' views regarding the reasons for only presenting 20 of the original 32 lessons for the intervention, despite the availability of teaching and learning time. Several reasons were given such as attending workshops, extracurricular activities, assessing learners and going on leave.

Time spent on teaching seems to be a challenge, not only for the intervention but also for daily teaching. For example, Teacher 7 taught fewer lessons than Teacher 3 because of attending to extracurricular activities. When Teacher 7 was asked whether he thought the extracurricular activities affected his teaching negatively, he indicated that they did so only to a small extent, affecting about 10% of his work. He further stated that he normally adjusts his scheme of work and makes sure that he covers 90% of his work. This might suggest that the teacher rushes through the lessons, which can negatively affect teaching quality. Although the teacher claimed to adjust his scheme of work, he did not seem to have done this for the intervention. His somewhat defensive response in attempting to minimise his absence from class points to the potential cumulative damage when loss of teaching time over a substantial number of days is not acknowledged, for what is not acknowledged cannot be addressed.

Another theme that arose was **changes in instructional practices**. There were two related aspects within this theme: improved instructional practices and explicitly teaching reading, as done in the intervention. Both teachers seemed to suggest that the intervention introduced them to a more effective teaching practice. They claimed that the intervention not only changed the way they taught but also improved learning. The teachers also described how they used to teach reading before the intervention, for example:

Teacher 3: Previously, we would just call a learner to come in front and read a passage. If they can't read, you help them. And that's all.

Teacher 7: Previously, you would find that learners sometimes would just be given texts to read. They will just read but not be guided. I would just tell them to read without guiding them; without following even strategies to comprehend. You find that that as if they didn't read the text. It's because of the way sometimes we give them just free reading without guiding them, without giving them strategies how to read, how to

comprehend, how to use vocabulary, all that. There were a lot of things which were missing.

The similar remarks in their statements suggest that they acknowledged that previously, they were not really teaching reading but only doing it and that they were assessing learners' reading skills which had not explicitly been taught. Although reflecting on their teaching practice is not sufficient to make a change, it may be an important first step in changing teacher behaviour.

The next aspect that emerged was that according to the data, the teachers adopted teaching practices advocated in the intervention lessons. Both teachers seem to have developed a positive attitude towards teaching reading as it was done during the intervention. The teachers were interviewed in December when normal teaching had stopped. Teacher 3, in particular, seemed keen to start using the *Teachers' Guide* in January when schools re-opened for the new academic year. In February of the following year, a follow-up was done to determine whether the teachers were actually using the *Teachers' Guide* as they had indicated. Both teachers indicated that they had already taught some of the lessons in the *Teachers' Guide* for developing reading fluency, suggesting that they found the instructional practices useful.

In sum, four aspects seem to have played a prominent role in the teachers' positive attitude to the intervention: (i) The teachers perceived the intervention as making the learners more positive about reading and taking a greater interest in it; (ii) they perceived the intervention as being helpful to themselves as teachers and to their learners; (iii) having worked through the *Teachers Guide*, they felt more empowered to teach reading and (iv) these benefits supported their intention to continue teaching as done during the intervention, which strengthened the potential sustainability of the intervention. These are four helpful steps in changing their teaching practices. If sustained, the positive attitudes portrayed by the teachers, when combined with more effective skills for teaching reading acquired during the intervention (i.e., increased self-efficacy) can be translated into the continuation of good teaching habits and consequently improved learners' academic performance. However, the sustainability of interventions is always a challenge because teachers may say things in the enthusiasm of the moment that they do not always follow through on. Follow-up post-intervention classroom visits and assessments of subsequent cohorts can establish to what extent the displayed changes in attitudes and instructional practices are sustained.

DISCUSSION

This catch-up reading intervention was a structured reading programme to guide Grade 5 teachers to teach reading more explicitly, to help their learners read more fluently and better comprehend reading materials at their grade level. The research questions enable us to address the critical question: Was the intervention effective? Based on the findings, in this section, we consider the efficacy of the programme from three slightly different perspectives: (i) Did it have a significant effect on the Grade 5 learners' reading abilities? (ii) Did the learners catch up to a point where they could better understand texts at their grade level? (iii) Did the structured programme bring about changes in teachers' attitudes and classroom practices?

Effects of the intervention: Control and intervention groups

Learners learn by being at school; therefore, there were expected improvements in decoding and reading comprehension across both control and intervention groups of Grade 5 learners during the year from pre- to posttests. However, the ‘business as usual’ control schools consistently showed less growth than the intervention schools. The intervention group, despite showing an initial disadvantage in performance at pretest time, consistently had larger effect sizes in both decoding (word reading and ORF) and reading comprehension, suggesting that the outcomes resulted from the intervention.

The word recognition scores of the intervention group more than doubled when compared to the control group, even though their initial word reading skills were weaker in the pre-intervention assessment. A similar pattern of performance emerged in the ORF results where the intervention group started with lower fluency scores and increased their fluency with a mean of 15.7 WCPM, more than twice that of the control group who showed an increase of only 6.7 WCPM.

In reading comprehension, although both control and intervention groups showed increases in their posttest scores, the intervention group had an effect size larger than the control group on the total mean point increase. This growth in reading comprehension also occurred for both literal and inferential reading comprehension. Both groups could answer literal questions better than inferential ones. However, larger effect sizes occurred for the intervention group on all measures of reading comprehension.

Another way to ascertain the efficacy of reading programmes in developing countries is to determine whether they reduce the number of learners who score zero on reading assessments. In the control schools, two learners could not read anything when the pretest was conducted and one who could not do so during the posttest. In contrast, 11 learners in the intervention group could not read when the pretest was conducted. This gap was reduced to only two learners during the posttest. According to the data, the intervention seemed to provide some support to very weak readers.

In conclusion, the data indicate that the structured reading programme may have brought about more significant changes in reading ability in the intervention group compared to the control group. Despite these positive changes, it is also important to consider whether the learners were able to catch up to a point where they could better understand texts at their grade level. This will be discussed in the next section.

Catching up: What does it take?

There is a very large body of empirical research attesting to the strong relationship between decoding and reading comprehension, and between fluency and reading comprehension, in both transparent and opaque alphabetic languages (Dehaene 2009; Caravolas, Lervåg, Defior, Seidlová-Málková & Hulme, 2013; Castles et al., 2018; Ardington, Wills, Pretorius, Deghaye, Menendez, Mohohlwane, Mtsatse & Van der Berg, 2020). Learners who have not yet mastered

the technical aspects of the written code to a level of fluency are severely hampered in their ability to understand what they read. Thus, fluency is a strong predictor of reading comprehension.

Although the decoding and reading fluency rates for both groups showed improvements from pre- to posttest time, their ORF scores at the end of Grade 5 still showed extremely low and slow reading rates, at 51 WCPM for the control group and 57 WCPM for the intervention group, similar to Grade 1 English home language (HL) readers at the 50th percentile (cf. Hasbrouck & Tindal, 2006). It should be noted that being an ESL reader does not necessarily mean being a slow reader. With explicit and systematic reading instruction, ESL learners can perform at the same level of decoding as their L1 peers. For example, studies on Latino readers in the USA who received explicit and systematic phonics reading instruction show that, on average, Grade 3 ESL learners can read 75 WCPM (Al Otaiba, Petscher, Williams, Pappamihiel, Dyrland & Connor, 2009) and Grade 4 learners can read 119 WCPM (Jimerson et al., 2013).

Based on their analysis of the large scale NEEDU Grade 5 ESL reading results in South Africa, Draper and Spaul (2015) argue that reading between 90–100 WCPM is desirable for Grade 5 ESL learners in the South African context. Analysing the same NEEDU dataset, Pretorius and Spaul (2016) found that reading at 70 WCPM served as a threshold for reading comprehension for rural school learners in the South African context. Although ESL fluency benchmarks have not yet been established in the African context, learners reading below 70 WCPM are likely to struggle to comprehend what they read, as supported by the findings in this study.

In light of current findings, the Namibian Grade 5 readers in this study were lagging very far behind their ESL peers in fluency and despite the gains they showed by the end of the year, they still had not caught up to fluency levels more appropriate to their grade. The best performing learners in the intervention group at the 75th percentile were reading at 76 WCPM and they had the highest reading comprehension scores of all the Grade 5 learners in the study. Following Pretorius and Spaul's (2016) findings that 70 WCPM seems to serve as a threshold for reading comprehension for ESL learners in South African schools, these learners at the 75th percentile had a better chance to comprehend texts at their grade level but even they had not yet caught up to their grade level.

Given that reading comprehension depends on the development and interaction of decoding and oral language comprehension and the complex processes that influence each of these aspects (Kim et al., 2016), the development of ORF can lead to the development of the more advanced literacy skills of reading comprehension. Graham and Kelly (2018) regard an intervention as successful if it improves learners' reading fluency. In this regard, the reading intervention was successful in increasing the Grade 5 learners' fluency but not yet to the point where they could be said to have caught up at grade level. The initial weak reading abilities of the entire cohort at pretest time attest to their slow reading development in earlier primary school. Improving reading comprehension abilities in middle primary school will only be

successful if learners' decoding and fluency skills are developed to much higher levels of performance in the early primary school years.

Although the intervention group improved more than the control group, their posttest reading comprehension score of 26% (albeit an improvement on their initial score of a mere 18%) shows how much catching up they still needed to do. McCormick (1996) argues that even 60% on a comprehension test indicates that learners still need a lot of support. The low and slow reading trajectories of the control and intervention readers in this study support the argument that reading comprehension skills will be severely delayed if decoding skills are not established in the early years of primary school.

Over and above the learners' poor decoding skills, the intervention was also curtailed, which meant that the learners had fewer opportunities to try and catch up. Although the intervention was generally implemented as designed, fidelity towards the intervention was reduced in terms of the number of lessons that were supposed to have been presented. Only 20 of the 32 lessons in the *Teachers' Guide* were implemented. Of the 17 lessons that focused on reading comprehension in the *Teachers' Guide*, only eight were taught, which suggests that not much time was devoted to improving the learners' reading comprehension levels. Attempts to improve reading in poor countries yield poor results because of chronic obstacles such as absenteeism, time wastage and limited reading materials (Abadzi, 2017).

Based on the improvement rate for the intervention group, one can argue that had all of the 32 lessons been presented, the intervention group might have had more opportunities to consolidate fluency levels and practise reading more strategically, thereby enhancing reading comprehension.

Changes in teachers' attitudes and practices

Providing teachers with teaching and learning materials and explaining to them what to do may not necessarily change teaching and learning outcomes. Several factors need to come together to bring about more lasting changes in classroom practice. As Pretorius and Knoetze (2013: 29) point out, 'changes in instructional practices are mediated by teachers' knowledge, beliefs and practices, as well as the support given to them'. The interview responses of the teachers who implemented the intervention helped to shed light on possible changes in their attitudes, perceived norms and feelings of self-efficacy during the intervention. On the whole, there was a fit between what the teachers felt about the intervention and the improved performance of the learners.

With regard to the attitudes and responses, several factors seemed to contribute to the positive attitudes that the teachers developed towards the intervention. Guskey (1986, 2002) argues that once teachers have tried a new teaching practice and find it effective, they tend to change their beliefs and attitudes. This seemed to be borne out in this study. The teachers reported that their learners, including those with low reading levels, participated more actively during the intervention lessons and seemed to take a greater interest in reading and these changes, in turn, inclined the teachers favourably toward the intervention. They observed that the learners liked

their reading lessons and because they were required to read every day and share their stories/texts with their classmates, they started to bring reading material to class to show their teachers and started developing a reading habit.

Along with changes in attitude, changes in prevailing norms and feelings of self-efficacy as well as a lessening of environmental constraints also need to occur before people will intentionally change their behaviour (cf. Fishbein et al., 2003). The teachers noticed that the intervention improved the quality of their teaching. As Teacher 7 remarked, '(previously) I would just tell them to read without guiding them'. By 'doing' reading in class rather than teaching it, teachers may end up believing that their learners are not capable of succeeding in reading. As Alsofrom (2018: 4) states, 'it is not that teachers are not working hard enough, but, rather, they are working to the best of their ability within the constraints of what they know how to do'. This, in turn, can shape normative beliefs about reading. Seeing that reading could be taught differently gave the intervention teachers a broader framework within which to evaluate their past practices and this brought about changes in normative thinking, as they admitted that the way they used to teach reading had not been helpful, compared to the more explicit and focused approach of the intervention.

The intervention also seemed to have brought about changes in their feelings of self-efficacy. Before the intervention, the teachers did not have much knowledge about reading and how to teach it. Although the teachers' knowledge of reading was not assessed in this study, the workshops with the teachers and the structured lesson plans in the *Teachers' Guide* made them more aware of the difference between decoding and reading comprehension, how they are related and how different classroom activities are needed to develop them. The intervention teachers felt more empowered to teach these aspects of reading to their Grade 5 learners.

Alsofrom (2018) argues that change in teaching practices happens if an intervention includes three aspects of change, namely change in tasks, material and knowledge. Providing teachers with appropriate tasks and material helps to reduce environmental constraints that might affect their intention to change their practices. The intervention included new activities and teaching and learning material, and supported teachers with knowledge about reading and its effective teaching practices through the *Teachers' Guide* for lesson plans and training/coaching. These changes and the positive responses of the learners to the activities motivated the teachers to express their intention to continue teaching in this new way.

The effectiveness of the *Teachers' Guide* in this study was evident in the teachers' expressed desire to continue using the *Teachers' Guide* and start presenting the lesson plans earlier at the beginning of the following year, to give all their learners a greater chance to improve their reading levels. The teachers also indicated that they had already shared (and would share) ideas in the guide with teachers for lower and upper grades, as they felt empowered by ideas in the guide.

The coaching component in this study also supported feelings of self-efficacy. The ongoing short but regular meetings aimed to introduce teachers to the content of the *Teachers' Guide*,

provide guidance and opportunity to practice how to teach the scripted lesson plans. The meetings offered opportunities to build a trusting relationship with the teachers so that they felt they could try something out of their 'comfort zone'. The teachers also received continuous support in terms of presenting the lessons, using teaching materials and tackling some challenges they experience in their classrooms. The lessons were discussed with the teachers before visiting their classes and they received feedback based on classroom observations.

With limited resources and limited knowledge about reading and how to teach it, teachers cannot be expected to change the way they teach reading. Because these factors were addressed in the intervention, the teachers felt that it helped them with how to teach reading. However, to maintain learning opportunities, teachers participating in an intervention need to be monitored and supported to increase fidelity to the intervention and reduce absenteeism. Teachers reported obstacles in presenting the lessons such as extracurricular activities, workshops, meetings and reduced teaching time due to general elections. The fact that only 20 of the intended 32 intervention lessons were implemented indicates the need to balance the demands of an intervention against the workload of the participating teachers and ongoing events inside and outside schools that distract them from basic teaching/learning opportunities.

Implications for literacy interventions

Everyone agrees that the ability to read with understanding is vital in the learning context. However, there is less consensus on how to go about improving reading comprehension when learners perform poorly in this area. The findings from this study highlight three main implication takeaways that are relevant for education contexts in developing countries.

First, interventions that aim to improve reading comprehension must take into consideration the decoding and fluency levels of the targeted learners and tailor interventions accordingly. Learners cannot improve their understanding of texts when reading independently if their decoding skills are so poor that they are unable to read information at the most basic, literal level. Higher-order understanding relies on the ability to understand explicitly stated information. However, fluent decoding abilities increase children's ability to understand literal information and free up more cognitive attention and energy for applying strategies and making inferences during reading.

Second, interventions that aim to improve reading comprehension must ensure that strong foundational reading skills are laid in the earlier years. Even though L2 English learners may read slower than L1 English readers, especially initially, falling behind on basic decoding abilities in the early years makes it far more challenging for learners to catch up in middle primary school. The learners in this study had already spent five years in school without anyone being aware that their basic decoding skills showed a serious developmental lag.

Third, the findings from this study suggest that targeting classroom practices through teacher empowerment is vital for enhancing the quality of teaching and learning in schools. Developing teacher content and pedagogical knowledge about reading, making teaching and

learning material available, providing ongoing support and maximising time on teaching/learner engagement are all factors that need to be built into reading interventions.

As the findings from this study show, as well as those from February (2018) and Nghikembua (2020), language teachers for lower and upper primary schools in Namibia need explicit training to develop a deeper knowledge of what reading entails (content knowledge) and be equipped with effective research-based instructional practices (pedagogic content knowledge) to teach it properly. Practising teachers need formal in-service training and professional development as well as coaching support. As Kim et al. (2016: 51) state, ‘rigorous training can change teachers’ attitudes, knowledge and instructional practices, and improve learners’ literacy achievements’. Such content knowledge can influence classroom practice. If teachers are made aware that skilled reading is complex and depends on several different language and code-related factors and that decoding enables comprehension, their teaching will be more focused and informed, making it less likely that learners will proceed to higher grades with such poor foundational reading skills.

Teaching and learning material should be made available to teachers and learners to reduce environmental constraints in implementing the intervention. In-service teachers who have not yet developed enough knowledge about reading and its instructional practices should be provided with a teachers’ guide describing how to teach various reading aspects and also be prescribed a good textbook on reading and how to teach it.

Piper, Sitabkhan, Mejía & Betts (2018) found that literacy programmes that used a teachers’ guide with scripted lesson plans, particularly those that are not overly scripted, have a significant impact on learning outcomes. Although this was a small study, the *Teachers’ Guide* with scripted lesson plans seems to have had a positive impact on teachers in this study. Although some scholars criticise scripted reading programmes for limiting teachers’ creativity and reducing their autonomy (Dresser, 2012), such concerns are generally the reserve of educational contexts in more affluent, high-performing countries than in middle- and low-income countries where poor quality teaching and poor literacy performance are pervasive. A teachers’ guide with scripted lesson plans works best for teachers with limited skills for teaching reading and who have few print-based material (Piper & Korda, 2011). As teachers develop more knowledge about reading and instructional practices, they can reduce their reliance on scripted lesson plans.

Reading interventions also require a coaching component. Through coaching, teachers receive necessary ongoing support for them to develop new knowledge and skills to improve their instructional practices and ultimately learners’ achievement (Pflepsen, 2018).

CONCLUSIONS

The favourable budget allocated to basic education in Namibia will only translate into improved learning outcomes if it is utilised to empower teachers to change how they teach reading in their classrooms.

The findings of this study support the assertion that in teaching practice, ‘there is a difference between experienced teachers and expert teachers; and that some practices have a higher probability of being successful than others’ (Hattie, 2015b: 2). A reading intervention that aims to improve both the decoding and comprehension abilities of primary school learners has a higher probability of being successful than one that focuses only on reading comprehension, especially if learners have very poor reading levels. Likewise, an intervention that builds teacher knowledge, provides guidelines for structured and explicit teaching practices, provides basic resources and gives ongoing support to teachers is more likely to change teachers’ intentions to change their classroom practices than one that does not include such features.

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