IMPROVING LITERACY IN SECONDARY SCHOOL GEOGRAPHY

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The aim of this research was to find the extent to which the literacy levels in reading comprehension of students entering a secondary school with low levels of reading and writing, would improve through content enhancement to aid in their cognitive development. The research was conducted in a secondary school in an educational district in Trinidad and Tobago that has one of the lowest primary school performance in the country. Form 1 Geography students at the secondary school, aged 11-13, expressed frustration in understanding geographical terms and concepts, thereby preventing them becoming proficient in the subject. They felt that teachers should help them understand the complex jargon in the subject. The *Qualitative Reading Inventory-4 (QRI-4)* diagnostic test was conducted prior to the intervention, to assess literacy levels for grade levels 4-6. Results from the diagnostic test indicated that the students' literacy level was below grade 7, which is the required level for Form 1. An action research approach, using three literacy strategies, namely, the Frayer Model, Audience-Centred teaching and Learning Logs, were implemented as the intervention during and at the end of each lesson over five weeks. Numerical and non-numerical data on students' performance and attitude to reading were collected and analysed. Overall, students improved in their reading comprehension, which resulted in an elevated level of writing through Audience-Centred Teaching, advancement in vocabulary use with the Frayer model, and student self-reflection by using Learning Logs. They made connections between text in the lesson, other subjects and their real life. They were also more engaged in class as they began to read, write and construct meaning in Geography. The main implication of this study is that all teachers should consider integrating literacy strategies within their classroom practice to assist their students in becoming proficient in reading comprehension.

Introduction

Conrad, Forteau-Jaikaransingh, and Popova (2013), citing Allington (2006) and Miller (1994), noted that students with reading challenges in Trinidad and Tobago, face a higher risk of reading underachievement in secondary school; especially boys who come from low-income families. They suggest that a student-centred pedagogy is needed that takes into consideration students' prior knowledge, skills, and socio-economic background to address the reading challenges. According to the Division of Educational Research and Evaluation, Ministry of Education, Trinidad and Tobago (2003), the Dream Catcher (DC) (pseudonym) Secondary School is in the second lowest of all eight educational districts in the country, reflecting one of the lowest primary school performances as measured by the mean Secondary Entrance Assessment (SEA) score (2001-2004), and the Academic Performance Index (API) for 2005-2007 (De Lisle, Smith & Jules, 2010). This poses a serious challenge for teachers to find appropriate literacy strategies for improving academic performance and developing a greater interest in academics and therefore in the Geography curriculum. As the acts of reading and writing are the bedrock of literacy, students with low levels of literacy experience difficulty in assimilating subject content and constructing meaning when learning Geography. These acts are complex and multi-dimensional. This study is important as it sought to investigate and bridge that gap between assimilating and constructing meaning.

Situational Context

The Dream Catcher Secondary School is a seven-year school located in an urban area in Northeast Trinidad with a population of approximately 950 students. The ages of the students range from, 11-19 years. Many of them belong to middle-income families. Each year, the DC Secondary School admits about 220 students in Form 1, most of whom scored above 50% average at the Secondary Entrance Assessment (SEA). The staff consists of 78 teachers: 23 males and 45 females. In 2001, the Universal Secondary Education (USE) was implemented in Trinidad and Tobago and the prior Common Entrance Examination, which students wrote in order to move from primary to secondary school, was replaced with the SEA.

The primary researcher was engaged in an action research course, *The Reflective Practitioner*, which was a requirement for completing the in-service post-graduate Diploma in Education Programme of the School of Education, The UWI St Augustine Campus in 2014 -15. As such, the primary researcher, an experienced classroom teacher at the DC school, observed that the overall trend for

the pass rate for Geography at the CXC, Caribbean Secondary Education Certificate (CSEC) level had been fluctuating. The results for 2014 was one of the lowest, at 56%, with only one student attaining a Grade 1. Whilst assessing this dilemma, she realised that students' ability to verbally express themselves far exceeded their ability to write coherently, and this trend was likely to continue. With this in mind, the researcher therefore believed that improving students' writing ability should be done as early as possible, namely, within the first year of entering the school. As such, for the intervention, the researcher, a Geography teacher, selected literacy strategies suitable for a Form 1 class that she taught, in an attempt to improve the reading and writing skills of the students.

The research purpose

The research sought to determine whether low academic performance and poor attitude to content-oriented reading and writing in a Form 1 Geography class would improve through the implementation of specific literacy strategies. A Likert-scale questionnaire, on students' attitude to reading and writing in class, was administered before the intervention. It revealed that 90% of the students scored less than 50% on the test. This indicated a poor attitude to reading and writing. As such, the researcher decided to implement specific reading and writing strategies, to aid students in cognitive processing, such as the Frayer Model, Learning Logs (Billmeyer & Lee Barton, 1998), and Audience-Centred Teaching (Butt, 1998). The study aimed to show that improving literacy levels of students, through strategies for content-oriented reading and writing, can improve their expression and their attitude to reading informational text in class. It is hoped that learning Geography might be more appealing if strategies for improving literacy levels can start from as early as Form 1, and continue throughout the higher forms. The following research questions were developed to realise the research purpose.

1. *To what extent has the implementation of specific reading and writing strategies (Frayer Model, Audience-Centred Teaching and Learning Logs) improved students' literacy levels in a Form 1 Geography Class?*
2. *To what extent has the implementation of reading and writing strategies aided in fostering a positive attitude towards reading and writing for meaning in a Form 1Geography class?*

Review of the Literature

Cognitive development is an area of interest found both in psychology and neuroscience, targeting children's abilities and aptitudes in

relation to their learning and behaviour when compared to that of an adult (Piaget, 1969). This theory of cognitive development proposed that learning is a dynamic process where learners create knowledge for themselves, but did not take into consideration the influence of the social context and interaction on learning that the constructivist view of learning promoted. According to John Dewey (1938), significant learning must incorporate an increased involvement and examination of one's thinking coupled with introspection and, as such, students should be provided with opportunities to think and articulate their thoughts.

Reading comprehension is the mental process whereby a reader constructs meaning from text. It is the process of "generating, articulating, negotiating, and revising interpretations and understandings within a community of readers" (Khezrlou, 2012, p. 83). It requires knowledge of reading strategies on the part of the learner and the teacher. O'Malley and Chamot (1990) categorised reading strategies as metacognitive, cognitive, and social/affective. They define a metacognitive learning strategy as one that 'involves thinking about or knowledge of the learning process, planning for learning, monitoring learning while it is taking place, or self-evaluation of learning after the task has been completed' (p. 231). Cognitive strategies refer to the steps or operations used in learning or problem-solving, beyond word identification. Oxford (2003) elaborated on the use of cognitive strategies by noting that "cognitive strategies enable the learner to manipulate the language material in direct ways, for example, through reasoning, analysis, note-taking, summarising, synthesising, outlining, reorganising information to develop stronger schemas (knowledge structure), practising in naturalistic setting, and practising structures and sound formally" (p.12). Reading comprehension is affected by background characteristics of the reader, the nature of the text and the ability of the teacher to apply cognitive strategies in the classroom. Lenz (n.d.) noted that the readers' prior knowledge of the topic, their desire to want to read, knowledge of language structures, how the text is structured, exposure to different genres of writing, reasoning ability, nature of engagement, and their learning style, all affect the reader's ability to comprehend text. Reading material that is organised, easy to read and suitable for their grade level can appeal to readers, whereas text that is poorly organised, complex and above or below their grade level can dissuade readers from interacting with text. Teachers can also affect reading comprehension as they play a crucial role in bridging the gap between the students and the content they have to learn. (Jordan, n.d.) By the application of content enhancement devices or techniques, such as advance organisers, graphic organisers, mnemonic devices and peer-tutoring; and content enhancement routines such as

comparison routine, and concept mastery routine (Sencibaugh, 2005) and through direct, systematic instruction, teachers model the process of learning to read.

Aarnoutse and Schellings (as cited in Sahan, 2012) noted that there are eight essential strategies that promote effective reading. These are 1) determining a reading objective; activating and using one's own knowledge with regard to the content of the text; 2) drawing connections or relations between words, sentences and paragraphs, predicting information and creating representations; 3) exploring the nature and structure of different types of texts; 4) discovering the theme and the main ideas in the text along with a summary; 5) posing and answering one's own questions; 6) planning, steering, monitoring and correcting one's own reading behaviour; 7) evaluating texts for their value; and 8) reflecting on the reading activities which have been executed and their results (p. 5).

The processes of reading and writing can help to enhance learning Geography in a more productive and meaningful manner, as prior knowledge or schema and new knowledge combine to build conceptual relationships (Glynn, 1991). Although relevant prior knowledge cannot guarantee meaningful learning, activation of prior knowledge is definitely a first step of instruction and should not be left to chance. For this, advance organisers have been considered as an effective way to activate it. According to Denham (2018), advance organisers are tools used before classroom instruction, which serve as a bridge between students' prior knowledge and what they are about to learn. He went on to state that, theoretically, advance organisers help to increase retention of new knowledge and skills by identifying the most important information, showing connections between concepts, and also help to activate prior knowledge.

Two ways whereby skills necessary for literacy and studying can be attained are by direct instruction where literacy skills are taught separately from content knowledge, or by functional instructions where literacy skills are ingrained within the context. According to Vacca (2002), research conducted on functional approaches paved the way for the shift from a skills paradigm to a cognitive paradigm. This action research followed a functional approach in the cognitive paradigm, with emphasis on learning from text using various instructional strategies.

In their research on increasing reading comprehension, Guthrie et al. (2004) integrated motivational practices with cognitive practices in a 3rd-grade class. They found that when teachers used a set of instructional strategies for concept-oriented reading along with motivation-supporting practices, their students performed better in reading comprehension, and were more engaged in reading than the class without the integration. The motivation-supporting practices

included hands-on activities, giving students choices, providing interesting texts and allowing collaboration in reading. According to Ulusoy and Dedeoglu (2011), content area literacy assumes that all students can be taught to read and write better. The concept of content area reading and writing allows students to comprehend content material by not only reading and writing but discussing, questioning, investigating, exploring, and organising (French et al., 1989).The main idea is to use language parts effectively to maintain high-level learning (Ulusoy& Dedeoglu, 2011). Content area reading and writing includes using strategies in class that model how to think about what is read, previewing content-specific vocabulary words, and asking questions while reading, among others (McGlynn & Kelly, 2018). Thus, collaboration between content area specialists and literacy specialists is key to finding ways to support all students in the content area classroom (Brozo, Moorman, Meyer & Stewart, 2013).

Many researchers have implemented literacy strategies in content areas over the years, with varying degrees of success across age groups. In a study conducted in Karachi, Pakistan by Nasir, Naqvi and Bhamani (2013), 39 students of a 5th-grade class were given a baseline assessment to explore pre-intervention writing skills at primary level. The authors shared the view that young students were lacking writing skills and teachers did not seem to be using proper writing processes. They then implemented literacy support strategies for 8 weeks using flash cards, word bank and journals for vocabulary development, after which they administered a post-test to determine if there was improvement in writing skills. The study found that 75% of the students showed the greatest improvement in the areas of vocabulary and grammar as well as structuring. Campbell and Parke (2018) investigated 23 8th-grade students who were taught how to use paragraph writing frames over a 12-week period. At the end of the study, quantitative data gathered revealed a significant improvement in students' writing in the areas of purpose, organisation, elaboration and evidence.

Literacy strategies for content area were researched by Fisher, Frey and Williams (2002), and Ming (2012). Fisher, Frey and Williams at Hoover High School in the United States, implemented seven literacy strategies across content areas including English, Social Studies, Art, Physical Education, Music, and Shop. The strategies selected were read aloud, K-W-L charts, graphic organisers, vocabulary instruction, writing to learn, structured note taking and reciprocal teaching. This school-wide focus on content area reading and writing led to increased student achievement. Ming selected strategies to ensure authentic writing. These were response journals for students to share their thoughts and emotional reactions toward text, and learning logs to keep track of their learning. Anticipation guides

were also suggested as an effective strategy to activate reading that was done independently, as pair work or in a small group setting.

Cavanagh (2005) noted that the scientist reads and writes differently when compared to a historian or mathematician. Therefore, the content area teacher needs to choose the appropriate strategy for the course material. Nevertheless, Billmeyer and Lee Barton (1998) found that there was no significant increase in academic performance despite the use of content area strategies, thereby implying no sound guarantee that the utilisation and implementation of reading and writing strategies will in fact increase academic performance.

Reading strategies selected for the intervention

Popham (2001) asks, in an era of high-stakes and high-stress testing, how do we ensure that classroom instruction does not give way to inappropriate teaching? It is common to believe that literacy instruction is solely the charge of language arts teachers. Moore, Bean, Birdyshaw, Thomas, and Rycik (1999) noted that adolescents entering the adult world in the 21st century will read and write more than at any other time in human history. Thus, literacy should be at the forefront of education. Dikmenli (2014) proposed that there are 34 new literacy fields, one of which is 'geographic literacy'. He defined geographic literacy as an approach towards events, situations and places, which requires understanding, comprehension and analytical skills. Improving comprehension skills is therefore necessary to improve geographic literacy and, as such, became the area of interest for this action research. Based on Billmeyer and Lee Barton's (1998) work, the three reading comprehension strategies for reading informational texts selected for the intervention were the Frayer model, Audience-Centred Teaching, and a learning log. The Frayer model is an essential tool for vocabulary development, which is the first strategy implemented. In Geography, it is useful for students to clarify their understanding of terms and concepts (Frayer, Frederick, & Klausmeier, 1969), hence its use in this study.

In the late 1980s, Andy Buck of the Institute of Education in London, first utilised audience-centred teaching for Geography (Butt, 1998). He investigated two groups of students, those who were assigned a task using audience-centred teaching as opposed to those who took notes. Slater (1989) using samples of the writing of Buck's students asked a group of geography educators to judge them. They found that the audience-centred pieces were more interesting whilst the note-taking pieces lacked life, were poorly structured and quite confusing. According to Butt (1993), some pre-conditions were necessary for getting students to write well. These were establishing trust between teacher and students; audience-centred writing had to be embedded in the scheme of work; and that the audience-centred

writing strategies had to be plausible for students to attempt, such as card sorting. Such tasks appear to help many students pass through 'intermediate' stages of understanding towards the eventual completion of high-quality writing. Butt (1998) noted, however, that audience-centred teaching on its own could not account for improvement in writing. He suggested that further research should be done on the type of teacher support that students received. Additionally, he felt that research needed to be done to determine the extent to which class and group discussion and formative assessment could account for improvements made. The different audience-centred writing strategies, such as card sorting and writing frames, which tapped into students' creativity, were selected as the second strategy for use in the study, through collaborative group work and individual work.

Billmeyer and Lee Barton (1998) supported the view that a learning log is a type of reflection strategy that could be used as the final strategy as it allowed students to express their feelings and observations of the strategies experienced. Learning logs help teachers to monitor students' reading outside of class, promote reflection and provide solid foundations for student interaction, class discussion and conferencing (McLauglin, 2010). Learning logs were therefore implemented in the study to allow students to write in a reflective manner.

Attitude to reading

In their review of the literature on the link between achievement and reading, Nootens et al. (2019) found that reading has an affective component. It is related to a student's interest, engagement, motivation, self-concept and attitude to reading. Fishbein and Ajzen (1975) defined attitude as a "learned predisposition to respond in a consistently favourable or unfavourable manner with respect to a given object" (p. 6), the term object referring to either entities (people, groups) or behaviours (e.g., reading) (Ajzen & Fishbein, 2005). The goals of reading are mainly for leisure or for academic purposes as required by the teacher. Factors that influence reading habits are the reading environment, both at home and at school, and the role of the teacher who does not see reading as a feminine pursuit. Nootens et al. (2019) reviewed a study conducted in the US in 1995, which revealed that there was an overall negative trend in attitude towards reading from Grades 1 to 6, with students in Grade 6, in particular, showing indifference and negativity towards academic reading. Further research in the US (1999, 2000,2012), Singapore (2008) and Croatia (2014) noted that a worsening of positive attitudes towards academic reading did not necessarily coincide with transitioning from primary to secondary school but rather with the

onset of adolescence. This is the stage in which young people's interests extend over a wide range of leisure activities which may see a decline in reading both for leisure and for academic purposes. Nootens et al. (2019) found that this transition period has been under-researched; reading attitudes change when students move from primary to secondary schools, and required further research. The claim that instruction in the content areas boosts literacy achievement has been put forward for decades. Existing insights advocate that literacy in the content area stimulates interest in reading and writing, and increases students' achievement.

Methodology

The design of the study utilised classroom action research. It is 'an act undertaken by teachers to enhance their own. or a colleague's, teaching to test the assumptions of educational theory in practice, or as a means of evaluating and implementing whole school priorities (Hopkins, 1993, p.1). Mertler (2016) noted that action research conducted by teachers can improve their effectiveness in studying their own classrooms with the aim of improving their practice in their particular contexts.The results of action research are neither right nor wrong. The tentative solutions are based on observations and other data collection methods. Action research requires monitoring and evaluation of the process in order to identify strengths and limitations. Conducting action research involves four steps (Mills as cited in Mertler, 2016). These are identifying an area of focus; collecting data; analysing and interpreting the data; and developing a plan of action. Although teachers may face some problems conducting action research, there is great potential to improve pedagogical practices. James and Augustin (2017) noted that if time and resources are allocated, at both the individual and institutional levels, gains in student achievement, improvement in teachers' practice and school improvement can be achieved.

Reconnaissance: Surveying the landscape

The primary researcher conducted the action research in two phases, that is, before the intervention (reconnaissance); and after the intervention (post reconnaissance). The first phase involved three aspects, namely, 1) the collection of demographic data on the students and their prior academic performance, and learning preferences; 2) the conduct of a diagnostic test to assess their reading comprehension level; and 3) the administration of the Likert Scale questionnaire on their attitude to reading.

Characteristics of the target population

The Form 1 target group was purposively selected, having been taught by the primary researcher during the previous term. The class comprised 39 students (20 boys and 19 girls) between the ages of 11-13, of which 14 were age 11, 20 were age 12, and five were 13 years old. The catchment area of the students reflected rural areas and districts from the main town and its environs in northeast Trinidad. Permission was obtained to conduct the study from the students of the Form1 Geography class and their parents, colleagues, and the school's administration. Pseudonyms were used to ensure anonymity of the students. To foster collaboration, the primary researcher requested that the Head of the Modern Studies Department, Vice-Principal and other teachers who had completed their Masters in Literature and Linguistics as well as other English Language and Literature subject teachers conduct clinical supervision of the lessons when possible. The primary researcher is not a reading specialist, but was concerned enough to attend to the literacy issue by searching online for free diagnostic reading methods, given the fact that there were no funds available for the purchase of other relevant reading and writing diagnostic tests.

The 2014 SEA results for the target group indicated that the Mathematics marks ranged from 52-97% and the English A marks ranged from 52-85%, placing them in the second lowest of all eight educational districts in Trinidad and Tobago. Over 64% of this group scored less than 75% at SEA, with five students scoring the lowest marks ranging from 44-60%. The English Language Assessment (ELA), having a maximum mark of 50, highlighted that approximately 50% of the target group acquired <75% for SEA, with 10 students obtaining the lowest marks ranging from 24.4-32.6. Marks obtained from mid-term test for Term 1 for September 2014 to December 2014 revealed that three students scored above 75% whilst the remaining 36 students scored between 17-72%. The end of term marks showed that only two students scored above 75% with 37 students scoring 26-72%.

Despite the fact that 97% of the target group had access to a television, only 5% owned a computer, 3% had access to the internet, 59% had access to a Digital Versatile Disc (DVD) player and 36% owned their own cell phone. The conduct of a Visual, Aural, Read/Write and Kinesthetic (VARK) learning style test revealed that the students were multimodal. The primary researcher used this information to assess the resources needed and available to the students. This allowed her to plan lessons more effectively. The target group also comprised students who relied on government assistance, in that, over 12% of the parents/guardians received government assistance, 21% and 33% of the students received breakfast and lunch at school, respectively, and 44% relied on government transport to get to and from school on a daily basis.

Diagnostic test used

The primary researcher needed to assess the nature of the literacy problems to guide the selection of the reading comprehension strategies. This required the conduct of a reading diagnostic test before the intervention. Leslie and Caldwell's (2006) *Qualitative Reading Inventory-4 (QRI-4)* diagnostic test, freely available online, was used to assess students' literacy levels, using passages for Grades 4, 5 and 6. *(QRI-4)* is an informal assessment instrument for word identification, fluency and comprehension for emergent to advanced readers. Teachers were allowed to reproduce appropriate pages from Chapter 15 of this publication for classroom use. The diagnostic test which was delivered in three steps, assessed literacy levels for Grade levels 4-6. Word Lists for Grades 4, 5 and 6 were provided along with the following rubric to identify students who were at the Independent, Instructional and Frustration levels of reading. (See Table 1).

Table 1: Rubric Used to Score Word List (word list total = 20)

LEVELS		
Independent	**Instructional**	**Frustration**
18-20	14-17	below 14
90-100%	70-85%	below 70%

Each of the expository passages for Grades 4 to 6 asked concept questions of the students. The Grade 4 passage was on plant structure for survival, the Grade 5 passage was on farming on the Great Plains, and the Grade 6 passage was on temperature and humidity, all topics relevant to Geography. Scoring rubrics for miscues and With Look-Backs were provided for the teacher for each passage.

The first step of the diagnostic test implemented was the use of word lists from grades 3 to 6. Each of the *QRI-4* word lists contained 20 words selected from passages at the same level of readability, and were designed to assess accuracy of Word Identification (WI), speed and automaticity of WI, and to determine the starting point for reading the initial passage. Table 1 shows the scoring rubric for the word list for each level.

The second step involved an Oral Reading Miscue Analysis. There are three types of miscues made while reading orally: whole-word substitutions, such as "tried" for "trade"; non-word substitutions, such as "trad" for "trade"; and omissions and insertions of words. By counting all miscues, the independent, instructional and frustration levels were obtained for each student. The total accuracy method was applied where the number of miscues were subtracted from the number of words in the passage and then a percent was derived, for example,

the passage "a trip" has 119 words, a student made 8 total miscues: $119-8 = 111$: $111 \div 119 = .93$: $.93 \times 100 = 93\%$.

The third step involved Assessment of Comprehension through Look-Backs. After asking the student to answer questions through writing, the researcher asked the student to look back in the text to locate answers to missed questions and/or to find answers to incorrect responses. Results from the diagnostic test administered for Comprehension through Look-Backs suggested that their level of literacy was below Grade 7, the required level for Form 1, as the students' readability level ranged from Grades 4 to 5.

The diagnostic tests showed that, from the word lists administered in the first step, 80% of the students were in the Independent Level for Grade 3 whereas the 20% were in the Instructional Level indicating that students' literacy levels were adequate for this Grade. However, at Grade 4, 28% of the students were at the Independent Level and 56% at the Instructional Level. Frustration Level increased from 15% at Grade 4 to 62% in Grade 6 (see Table 2). Table 2 shows the results of the students' performance from the word lists based on the diagnostic tests, before the intervention. This indicated that the intervention could be conducted from the Grade 4 level since no one was at the Frustration Level in Grade 3.

Table2: Before the Intervention: Students' Performance From the Word Lists for Each Level

Grade Level	Independent Level	Instructional Level	Frustration Level
Grade 3	80%	20%	0%
Grade 4	28%	56%	15%
Grade 5	10%	51%	38%
Grade 6	5%	33%	62%

For the Oral Reading Miscues in the second step, the rubric used to assess miscues for passages (see Table 3) and the students' performance oral reading miscues analysis (see Table 4) show that as the Independent Level decreased, Frustration Level increased.

Table 3: Rubric Used to Assess Reading Miscues for Passages Read

Independent Level	Instructional Level	Frustration Level
98% Accuracy	90% to 97% Accuracy	less than 90% Accuracy

Table4: *Before the intervention: Students' % Accuracy for the Oral Reading Miscue Analysis*

Grade Level	Independent Level	Instructional Level	Frustration Level

Grade 4	8%	79%	13%
Grade 5	3%	59%	38%
Grade 6	0%	23%	77%

For assessing Comprehension through Look-Backs in the third step, after asking the student to answer questions through writing, the researcher asked the student to look back in the text to locate answers to missed questions and/or to find answers to incorrect responses. If they got eight answers correct, they were at the Independent Level; at the Instructional Level with six-seven answers correct; and at the Frustration Level with less than five answers correct.

Table 5: Before the intervention: Students' performance of Comprehension through Look-Backs

Grade Level	Independent Level	Instructional Level	Frustration Level
Grade 4	8%	79%	13%
Grade 5	3%	59%	38%
Grade 6	0%	23%	77%

The assessment of Comprehension through Look-Backs showed that as the Grade Level increased so did the Frustration Level (see Table 5).

The Attitude Test

The attitude test consisted of seven questions designed to capture students' attitude to reading for enjoyment (two questions), and for capturing their experiences of academic reading in the classroom (five questions), providing the researcher with insight into their self-esteem as readers. A 5-point Likert Scale questionnaire, with options ranging from strongly agree to neutral to strongly disagree, had been previously created and tested in a similar classroom action research conducted by a colleague of the primary researcher (unpublished Diploma in Education Action Research, 2011). It was administered before the reading intervention strategies to assess the students' reading attitude, which can be seen as their attitude upon leaving primary school, and later administered after the intervention to capture their attitude to reading as students in their first year of secondary school. Their responses were scored numerically, and analysed using descriptive statistics.

Reconnaissance: Planning for the intervention

For the second aspect of the reconnaissance phase of the research, that is, planning for the intervention, the Theme, "The World Around Us" was selected. It encapsulated both the Natural and Human systems of Geography as outlined in the revised version of the Form 1

SocialStudies Curriculum of the Ministry of Education. The unit of lessons prepared by the teacher began from a Grade 4 to Grade 6 to facilitate scaffolding. A textbook at the readability level of Grades 4 to 5 was used for content for lessons one, four and five and the content derived from the various websites was obtained for the appropriate grade level.

Based on the literature reviewed, three specific reading and writing strategies were used to develop reading comprehension. These strategies were the Frayer Model, Audience-Centred Teaching, and Learning Logs. The Frayer model (1969) was a strategy used to aid in vocabulary development and understanding concepts. Audience-centred teaching aimed at involving children in writing to, or for, audiences different from the ones they would normally encounter in the geography classroom, that is transactional or academic writing, usually required by the teacher. Butt (1998) suggested that the effectiveness of audience-centred teaching may be increased by using a range of 'intermediate' teaching strategies by structuring and prioritizing tasks. For example, before students attempt extended writing strategies, activities such as card sorting and writing frames, are encouraged as well as the use of different genres of writing.

Learning Logs allow reflection on either text content or on students' reading and learning processes. Students may reflect on how they feel, but it is always in relation to what is being learnt in the classroom (Billmeyer & Lee Barton, 1998). Therefore, they were allowed five minutes to process their thoughts and five minutes to write their views, during each lesson. Comparison of scores was made between those of lesson one to the final lesson for each of the three reading comprehension strategies that used Word Identification, Oral Reading Miscue Analysis, and Assessment of Comprehension through Look-Backs.

Post Reconnaissance: Applying the Intervention

After the results of the diagnostic tests were analysed, data collection instruments were designed to answer the research questions. As research question one focused on students' academic performance, data was derived through scores from each of the reading and writing exercises for each lesson, and analysed with descriptive statistics.

For research question two that focused on students' attitude to the strategies used and overall attitude to reading and comprehension, both numerical and non-numerical data were collected. Scores for the attitude test were analysed using descriptive statistics. Non-numerical data included teacher's journals to track students' behaviour and performance, and students' learning logs collected after each lesson. They were analysed for significant trends by coding and analysis of text to arrive at themes. A teacher-made checklist was used to track

students' performance and behaviour during the intervention. In addition, each lesson was video-taped and analysed within one day of recording to capture students' responses to the reading strategies. Data recorded in tables and graphs displayed trends in students' performance. The collection of non-numerical and numerical data before and after the intervention ensured trustworthiness of the study.

Implementation

Eight lessons, over five weeks, were taught during double periods (for a total of 560 minutes) from 12th January 2015 to 13th February 2015. The lessons based on the unit of "The World Around Us" dealt with the spatial variations of the world in relation to international, regional and local scales. The students had never been taught the concepts before. The attributes of the Frayer Model were explained to the students. The teacher incorporated the reading and writing strategies of the Frayer Model, Audience-Centred Teaching and Learning Logs in each lesson. The Frayer Model was used throughout the entire intervention to facilitate vocabulary development, which constitutes the first strategy in reading comprehension. This strategy aligned with the word list aspect of the diagnostic test. Using the Frayer Model, students analysed a word or concept by defining it and listing its characteristics. They also refined their understanding by choosing examples and non-examples of the concept because in order to understand completely what a concept was; one needed to know what it was not. The model completed in the first lesson comprised words and phrases as answers, but as the intervention continued, the answers consisted of sentences. Information on the use of the Frayer Model was obtained from teacher-led discussions, teacher-made hand-outs, students' responses and the dictionary. Students were allowed to work individually, in pairs, and in groups to complete the model.

The Audience-Centred Teaching method was chosen to improve the writing skills of the students. The lessons were scaffolded by using a range of 'intermediate' teaching strategies for structuring and prioritising tasks in such a way that the students worked in pairs, in groups for the first few lessons, then individually for the last three lessons, using a variety of genre writing (see Table 6).

Table 6: Audience-Centred Teaching Strategies Implemented for Lessons1 to 8

Lesson #	Audience-Centred Teaching Strategies in each Lesson
1	Genre Writing - Expository Writing – Creation of a Poster (Group Work)
2	Writing Frames used to create a song (Group Work)
3	Writing Frames used to create Paragraphs (Individual Writing)
4	1. Card Sorting Activity (Individual activity)

	2. Genre Writing-Persuasive Writing (Advertisement Poster) (Group Work)
5	Genre Writing- Expository Writing- Poster (think-pair-share)
6	Writing Frames for Paragraphs to compare and contrast (Individual Writing)
7	Genre Writing – Poetry Writing (Individual Writing)
8	Genre Writing- Descriptive Writing (Individual writing)

Informational text prepared by the teacher consisted of lessons with increasing readability levels. Informational text for lessons 7 and 8 extracted from the text possessed a readability level at Grade 6 to facilitate scaffolding. Each lesson was monitored by the teacher. Tracking of students during the intervention enabled the researcher to determine a change in attitude towards reading and writing in Geography. Teacher journals and learning logs were considered essential to determine if changes in attitude towards meaningful reading and writing did transpire. The teacher prepared a post-test at a readability level of Grade 6. This was in the form of a written test with five questions aimed at assessing content delivered during the intervention. It emphasised the cognitive domains since the study focused on the teaching of reading and writing. All the passages administered for Grades 4-6 (pre-diagnostic) were re-administered at the end of the intervention (post-diagnostic).

Summary of Findings

Research Question 1: To What Extent has the Implementation of Specific Reading and Writing Strategies (Frayer Model, Audience-Centred Teaching and Learning Logs) Improved Student Literacy Levels in a Form 1 Geography Class?

The Frayer Model, which helped develop vocabulary and jargon relevant to Geography, was incorporated into all lessons and assessments, and therefore was not analysed separately. Figures 1 to 3 show the results of the implementation of the Oral Reading Miscue Analysis before and after the intervention using the reading and writing strategies for Grades 4, 5 and 6. Of particular interest is that for Grade 6, the students' Frustration Levels decreased from 77% to 3% and their Instructional Level increased from 23% to 97% after the intervention (see Figure 3).
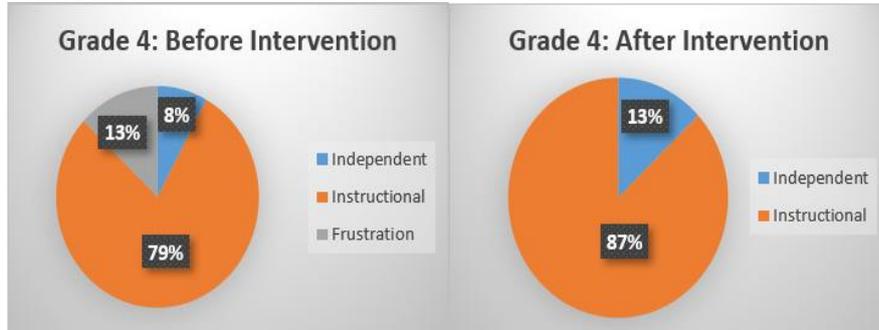
Figure 1. Accuracy Level for Oral Reading Miscues before and after intervention for Grade 4 passage
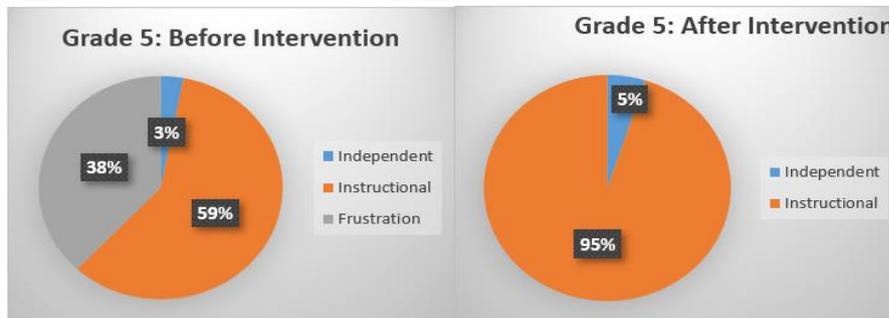

Figure 2: Accuracy Level for Oral Reading Miscues before and after intervention for Grade 5 passage
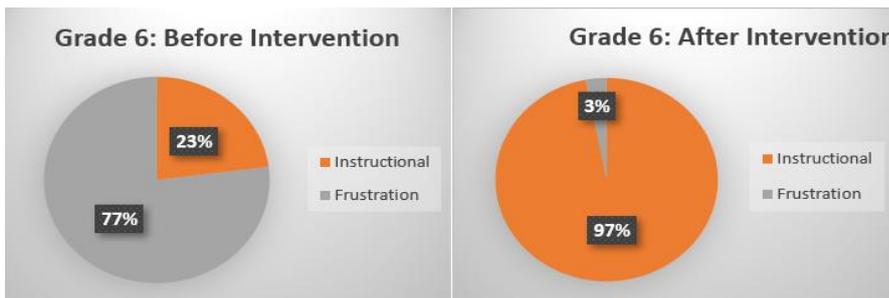

*Figure*3: Accuracy Level for Oral Reading Miscues before and after intervention for Grade 6 passage

The mean score for accuracy levels for the Oral Reading Miscues increased at each level after the intervention. For Grade 4 level, the mean score increased from 93% to 95%, for Grade 5,

students' marks increased from 90% to 94%, and for Grade 6, students' marks increased from 88% to 93% thereby increasing accuracy levels in their reading. Scores obtained from this intervention suggest that there was an increase in academic performance.

The diagnostic tests administered for writing involved Comprehension with Look-Backs. This strategy also appeared to increase performance in literacy. Writing scores revealed that after the intervention at Grade 4, 100% of the students were at the Independent and Instructional Levels, at Grade 5, 33 % were at the Independent Level, 62% at the Instructional Level, and 5% at the Frustration Level. Grade 6 results showed that 23% were at the Independent Level, 69% at the Instructional Level and 8% at the Frustration Level. Even though students remained at the Frustration Level for Grades 5 and 6, there was an increase in marks for these students. This increase was probably due to the change in teaching strategies, which may be more suitable to the multi-modal learning preferences of these students.

The scores derived for Comprehension with Look-Backs showed an increase for all the Grade levels after the intervention. The mean score for Grade 4 level increased from 5.6 to 7.2 (maximum mark being 8 for all levels), for Grade 5 from 4.6 to 7.1 and for Grade 6 from 4.2 to 6.7 (see Table 7). In all Grades, the standard deviation was smaller after the intervention than before, indicating that many students were becoming more competent in writing.

Table 7: Results Derived from Comprehension with Look Backs for Writing Assessment(Maximum score of 8)

Calculations	Grade 4		Grade 5		Grade 6	
	Before	After	Before	After	Before	After
Mean	5.6	7.2	4.6	7.1	4.2	6.7
Mode	6	8	4	7	5	7
Median	6	7	4	7	4	7
Range	2-8	6-8	3-7	5-8	2-6	5-8
Standard Deviation	1.069	0.767	1.208	0.857	1.167	0.910

Results for the Audience-Centred Teaching strategy were positive. This strategy was chosen to improve the writing skills of the students, and followed a scaffolding technique where students moved from paragraph writing to essay writing. Marked improvement for writing was observed after lesson #3, and from lessons #4 to lesson #8 there was a progressive increase in writing skills (see Table 8).

Table 8: Students' Performance for the Audience-Centred Teaching strategy

Lesson #	Audience-Centred Teaching Strategy used for each lesson	N (number of groups or students present for strategy)	Mean score (%)	Range (%)
1	Genre Writing - Expository Writing – Creation of a Poster (Group Work)	13	91.0	25-100
2	Writing Frames used to create a song (Group Work)	6	58.7	42-77
3	Writing Frames used to create Paragraphs (Individual Writing)	39	47.8	10-80
4	1. Card Sorting Activity (Individual)	39	97.9	86.7-100
	2. Genre Writing- Persuasive Writing (Advertisement Poster) (Group Work)	6	88.3	80-100
5	Genre Writing- Expository Writing- Poster (think-pair-share)	19	91.8	75-100
6	Writing Frames for Paragraphs to compare and contrast (Individual Writing)	39	85.4	83.3-100
7	Genre Writing – Poetry Writing (Individual Writing)	39	93.3	83.3-100
8	Genre Writing- Descriptive Writing	39	94.6	87.5-100

At the end of the intervention, notable observations were made. Scores improved from lesson #1 in which six students out of the class of 39 students obtained 19%, 24 students obtained 38% and nine students obtained 56%; whilst for lesson #8, six students obtained 88%, 22 students obtained 94%, and 11 students obtained 100%. A post-test was given at the end of the intervention based on definitions, using the Frayer Model, concept maps paralleling audience-centred writing, and spatial location in keeping with Geography content. The results showed that four students scored 100%, 32 students scored between 90-99% and three students scored 89%.

Research question 2: To What Extent Will the Implementation of Reading and Writing Strategies aid in Fostering a Positive

Attitude Towards Reading and Writing for Meaning in a Form 1 Geography Class?

Results were analysed from the attitude test, students' written reflections through the learning logs administered, and teacher observations at the end of each class. The results of the attitude test before and after the intervention (see Table 9) show a positive change for most students in attitude to reading for enjoyment, and for academic purposes, where the mean, median and modal scores all increased. The increase in the standard deviation values, however, showed that there were some (three) students who scored low on the attitude test, thus accounting for the higher value after the intervention. For those students, reading may still be seen as a challenge.

Table 9: Results of the Attitude test

	Total score	Mean	Median	Mode	Std Deviation
Before	35	17.01	17	16	3.7
After	35	27.4	27	23	5.2

Students' written reflections indicated evidence of the schema theory as students made connections with the text in the lesson to other classes, and even to their real life (see Table 10). The intervention seemed to have had an impact on their understanding as one student stated that '*I wrote a song for the first time*'. There was an increase in the level of motivation since the majority of students wrote that they were '*more interested in the topic*', as lessons proceeded, not having done it before. The phrase, '*made me better*' suggested that the change of teaching strategies stimulated interest and encouraged students to work harder. Working in pairs and in groups appeared to have fostered cooperation. During the early phase of the intervention, the majority of students did not write much content in their learning log, but as the study progressed, there was an increase in the number of words and the quality of content in the learning logs. This indicated that students began to read, write and construct meaning in Geography.

Table 10: Themes from students' learning logs

	Themes	Words/phrases	Conclusion
1.	Instructional strategy	Enjoyed learning today Enjoyed working with others	Students seemed to enjoy and embrace this method of teaching
2.	Assessment	Rubric helped me understand what to write	Students grasped the idea of what is required when being tested.
3.	Students' understanding	Wrote a song for the first time Helped me to write poetry better	The reading strategies were generally effective and facilitated a better understanding of concepts.
4.	Student engagement and involvement	Made me better	The change of teaching strategies stimulated interest and encouraged students to work harder.

5.	Schema	Text to text:
		    Reminds me of English class
		Text to self:
		    Topic (Borders and Boundaries) reminded me of my trip to the United States
			The implementation of the reading strategies allowed the students to use their prior knowledge. Reading and writing comprehension skills were being developed.

6.	Motivation to read	More interested in topic	Students displayed willingness to read and write more, impacting on a positive attitude.
7.	Cooperation among students	Appreciated working with others	Students working in groups and pairs presented the opportunity for students to receive and respond to ideas in a positive and harmonious way

As the intervention proceeded, the students became more participative, committed and enthusiastic. Audience-Centred Teaching promoted a level of independence and understanding among the students as they appeared to enjoy the opportunity to work on their own or with others of their choosing. Students' use of handouts, the notes they produced from discussions and the dictionary indicated that they completed the Frayer Model at an increasing level of detail for definitions, descriptions and examples.

Phrases extracted from the teacher's journal, and observations, indicated that there was a positive change in the students' attitude towards reading and writing. By lesson 5, the teacher researcher made the following observation:

> *I am hearing fewer questions as well as students are less reluctant to approach the techniques implemented in the study. This leads me to believe that students' confidence has increased and they are reaching a level of self-instruction. Students seemed to be quite enthusiastic and willing to contribute to class activities more readily.*

By the end of lesson 8, the teacher observed:

> *It is truly a joy to see my students reach a different and new level. They display a higher level of maturity and self-instructed learning. It is really amazing to see these students use their Atlas on their own, to listen to meaningful discussions without much teacher guidance, question what they are receiving and probe more into the 'why' aspects of their learning. The higher order thinking was truly untapped and even the discipline level has increased as students appear to be more settled and focused.*

The teacher observation checklist looked at students' level of participation, and response to oral questions, and willingness to present work in class. Results from the analysis of the videos of each lesson, are shown in Figures 4 to 6.
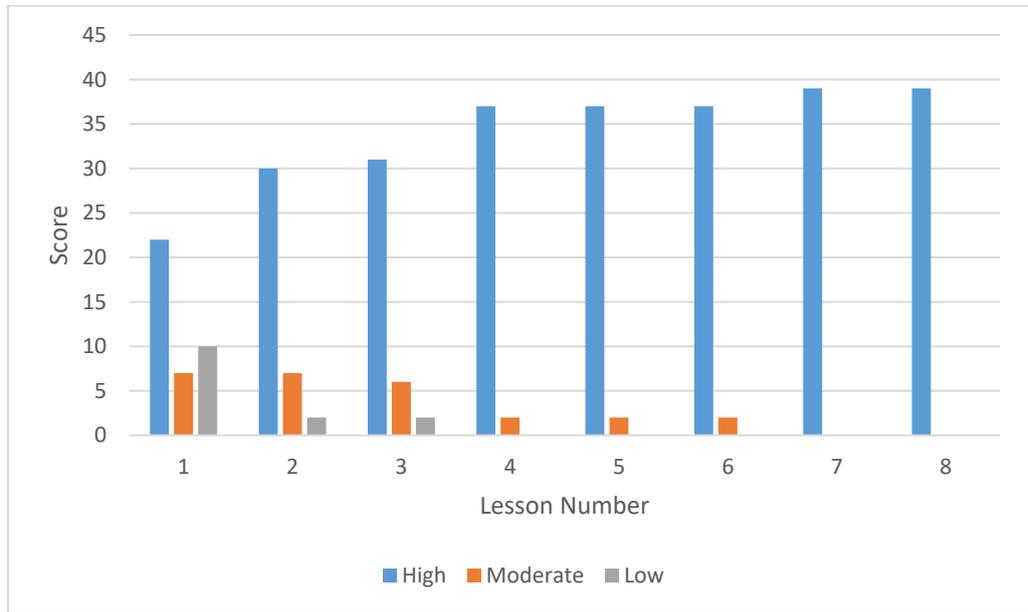
Figure 4: Level of students' participation throughout the intervention
Note: High level: students participated in all activities; Moderate level: students participated in some activities; Low level: students participated in few or no activities.
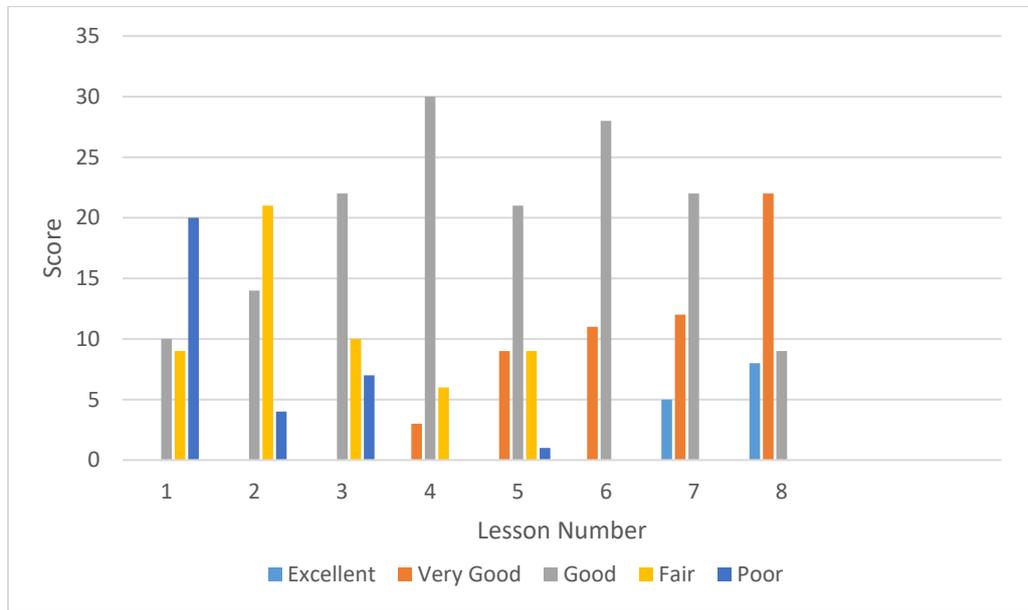

Figure 5: Response to oral questions throughout the intervention
Note: Excellent: Student answered 9-10 times; Very good: Student answered 7-8 times; Good: Student answered 5-6 times; Fair: Student answered 3-4

times; Poor: Student answered 0-2 times (done by taking a sample of students during each lesson).

Figure6: Students' willingness to present work to class throughout the intervention

Note: 'Willingness': Eagerness to complete tasks and present work in a given time taken from a sample of those who voluntarily responded; 'No': No work submitted during that time.

The findings obtained from this study suggest that there was a general improvement in the students' academic performance and a positive attitude towards reading for meaning in Geography.

Discussion

This classroom action research began with the idea that all students can learn to read and write better. Graphic organisers, vocabulary instruction, and writing to learn were some of the literacy strategies that Fisher et al. (2002) used in the Social Studies content area. These were incorporated in this present study through selected strategies for reading and writing, namely, the Frayer Model, Audience-Centred Teaching and Learning Logs in a Form 1Geography class. Overall, these appeared to have had a positive impact on the students' academic performance. Through these strategies, most students were able to relate better to the content area of Geography as they were encouraged to question, explore, investigate, discuss and organise before writing, an approach that promoted high-level learning (Ulusoy &Dedeoglu, 2011). French et al. (1989) and Guthrie et al. (2004) suggested that

when teachers integrated literacy instruction in the content areas and students are given more opportunities to read and write, the result was an escalation in conceptual knowledge, reading comprehension and problem-solving skills thereby elevating academic performance.

From the diagnostic tests for Grades 4-6, progress was recognised in the three phases of cognitive development. This included an elevated level of writing from the usage of Audience-Centred Teaching, advancement in vocabulary use supported by the introduction of the Frayer Model and reflection by using a learning log at the end of each lesson. Billmeyer and Lee Barton (1997) argued that literacy in the content areas does not guarantee an increased performance. However, even though some students remained at the Frustration Level, findings from this classroom action research showed the opposite with 100% of the students showing gradual improvements in both reading and writing from Grade 4 to Grade 6. However, for the student who remained at the Frustration Level for the Oral Reading Miscue Analysis, the selected cognitive strategies may have impeded the student's understanding of the text and also may not have been suitable to that student's learning preference.

Audience-Centred Teaching exposed students to a variety of writing genres from poem and poster creation to expository writing. This gave students the opportunity to develop their comprehension and analytical skills, building their geographic literacy skills, one of 34 literacy skills proposed by Dikmenli (2014). Students' mean scores produced from writing frames that were done individually by students in lessons #3 and #6 were 47.8% and 85.4%, respectively. This increase in mean scores were similar to findings of Campbell and Parke (2018) who found that there was significant improvement by 8th-Grade students who used writing frames. Their study, however, was conducted over 12 weeks as opposed to five weeks in this study. Card sorting, as part of the Audience-Centred Teaching as suggested by Butt (1998), was well-received as the mean score for this activity was 98%. This suggests that the scaffolding of strategies in Audience-Centred Teaching appeared to build students' confidence to move onto more demanding reading and writing tasks.

The use of the Learning Logs gave students the opportunity to engage in authentic writing as they shared their thoughts and emotional reactions to texts and to keep track of their learning, similar to Dewey's (1938) observation that introspection was needed for significant learning and Ming's (2012) study for content areas of Art, Mathematics, Music and Physical Education. In this way, the primary researcher was able to assess their reactions to the strategies and gain insights into their attitude to reading and writing. Learning Logs also helped the teacher monitor students' reading outside class, where they were able to make links with other subjects, a finding similar to that of

McLaughlin (2010).In addition, the comments from the students' Learning Logs suggest that they were on their way to becoming effective readers, through reflection on their work, as suggested by Aarnoutse and Schellings (as cited in Sahan, 2012).

With respect to changing their attitude to reading and writing, the students' responses through their reflections and the attitude test showed that there was an overall positive attitude to reading and writing in the content area of Geography, as they improved in their Oral Miscues, and Comprehension through Look-Backs. These results align with Johnson and Giorgis (2001), who suggest that reading and writing in the content areas motivate students to read and write. According to Slavin (2006), learners must individually discover and transform complex information if they are to make it on their own. In this study, students were given the chance to work individually but only after they developed the confidence by working in groups. Accessing prior knowledge in each lesson encouraged students to respond to assignments, leading to improvement in their scores, a finding reached by Glynn (1991), who noted that learning was enhanced by building conceptual relationships onto existing schema.

The advance organisers used in each lesson consisted of many geographical examples, and images that may have contributed to the improved results. This finding reflects those of Park (2005), who found that use of visual imagery contributed to improved reading and writing. Content enhancement techniques such as advance organisers, graphic organisers (the Frayer Model) and peer-tutoring appeared to aid in the students' ability to comprehend text as suggested by Sencibaugh (2005). Combining instructional strategies in the content area through the use of the Frayer Model, Audience-Centred Teaching, and Learning Logs may have led to the improved performance of the students. This is in keeping with the findings of Guthrie et al. (2004) for improving reading in the content area. The exposure to creative writing skills through the use of different writing genres appeared to improve students' writing skills. These results were similar to the findings of Nasir et al. (2013) where creative writing led to improvement in vocabulary and grammar and better structure to students' writing.

Implications of study

The positive results of this study conducted over five weeks suggest that there is merit in integrating literacy strategies in content areas other than Language Arts. The findings suggest that the study should be a longitudinal one, for example, following this same Form 1 up to Form 5 to see if the improvement in reading and writing can be sustained or improved in the teaching of Geography. In this way, there

could be improved academic performance in Geography at the CSEC level, the concern that drove this study. Other strategies can also be integrated to suit the level of cognitive and emotional development of the students. In order to improve overall student academic performance at the CSEC level, there should be a whole school approach in all subject areas to integrate similar literacy strategies in all Forms starting in Form 1, as literacy skills in one subject can be transferred to other subject areas. The study could be extended to assess the literacy levels of household members of the students with the aim of creating better support in the home environment for the student, and so foster a better home-school relationship.

As Brozo et al. (2013) suggested, collaboration between content area specialists and literacy specialists is key to finding ways to support all students in the content area classroom and, in the absence of a literacy specialist, the teacher as researcher in classroom action research can fill that gap. The use of a diagnostic test provided an objective way to determine the nature of students' reading issues rather than guesswork on the part of the teacher, and in this way, the reading comprehension strategies could be targeted to specific reading challenges they face, making teaching effective. Nootens et al. (2019) concluded in their literature review of literacy challenges in schools that there is a worsening in attitude to reading as an adolescent gets older, given their widening range of interests in schools. As such, classroom action research could provide further insights into this apparent trend. This action research provided an overview of useful cognitive strategies, such as reading comprehension, organising lesson plans, resources and assessment instruments, for the classroom teacher, who might not be a reading specialist, to implement. The acts of reading and writing are the foundation of literacy, which are the key elements for students' growth. It is vital for both the academic and emotional well-being of the student and is a core ingredient in the crafting of a holistic child.

Recommendations

Diagnostic tests should be conducted to get a more accurate assessment of the nature of students' reading comprehension challenge, and for selecting relevant literacy strategies to meet those challenges. Opportunities should be given to teacher-researchers to conduct classroom action research regularly and to share their findings, with the aim of critiquing the methodology for other teachers. In order for validity and reliability to be maintained, the study should be conducted over a longer period. A longitudinal study should be conducted with the students from Form 1 to Form 5 to see the extent to which the reading comprehension strategies improved their

academic performance, and to what extent use of these strategies could reverse a possible decline in a positive reading attitude. A wider range of strategies should be explored to suit the nature of the students as they progress through their years at the school. Other teachers should be encouraged to implement these or similar strategies in other classes to arrive at best teacher practices. In the absence of a literacy specialist, all teachers with an interest in teaching reading in the content area should be encouraged to collaborate with other colleagues in Geography and other subject areas and share their findings to improve literacy in all classrooms.

Conclusion

Three specific reading and writing strategies of the Frayer Model, Audience-Centred Teaching and Learning Logs were implemented in this action research to improve literacy in Geography. Literature based on these strategies, and the results derived, suggest that the intervention may have had a positive impact on the cognitive development of the students. The findings obtained from this action research imply that there was a general improvement in the students' academic performance and a positive attitude towards reading for meaning in Geography. As the sample size is relatively small, and as the duration of the action research was short, no significant generalisation can be made from the results. This research was carried out only in one group in one school by the primary researcher, a classroom teacher. While the size of the study may not allow for generalisations beyond the research site, the results of the study, can provide a stimulus for other teachers to conduct similar research to attend to the issue of low levels of literacy in secondary schools, taking into consideration contextual differences in academic levels, setting, population, teaching staff, and resources.

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