Creative Education, 2022, 13, 3624-3641
https://www.scirp.org/journal/ce
ISSN Online: 2151-4771
ISSN Print: 2151-4755

A Study about the Prevalence of Code Switching in the Junior Secondary Physical Science in the Oshana Education Region

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How to cite this paper: Kamati, A. M., Nghipandulwa, L. L. T., & Chirimbana, M. (2022). A Study about the Prevalence of Code Switching in the Junior Secondary Physical Science in the Oshana Education Region. *Creative Education, 13,* 3624-3641.
https://doi.org/10.4236/ce.2022.1311231

Received: August 18, 2022
Accepted: November 22, 2022
Published: November 25, 2022

Abstract

This study was conducted to investigate the prevalence of code switching in the Junior Secondary Physical Science teachers in the Oshana Education Region. The purpose of this study was to find out the extent to which code switching was practised by the Junior Secondary Physical Science teachers in their classrooms. The study sought to answer the following question: What is the prevalence of code switching in the Junior Secondary Physical Science in the Oshana Education Region? The study followed a mixed research design approach (quantitative and qualitative) to collect data from the participants. The population of this study consisted of all the Physical Science teachers for Grades 8 - 10 in the Oshana Education Region and then a sample of 22 teachers was drawn from 10 schools of the population of Grade 8 - 10 Physical Science teachers in Oshana Education Region. In an attempt to get a representative sample of the population, a combination of stratified sampling technique and convenience sampling was used for this study to select the sample. All accessible Junior Secondary Physical Science teachers from the selected schools in the identified strata were conveniently chosen for the study. Triangulation was used by conducting lesson observations, administering questionnaires as well as conducting interviews to collect the data. The findings from the observations, questionnaires and interviews revealed that code switching was prevalent in the Oshana Education Region in Grade 8 - 10 Physical Science classrooms. About 58% of the teachers' code switched during the lesson observations, 85% admitted that they code switched during the interviews and 77.3% of the participants in questionnaires stated that they code switched in an average Physical Science lesson. It was found from the interviews that 85% of the participants admitted that they code switched in their

Physical Science lessons. The study further found that teachers' code switching was more prevalent in the classrooms where teachers had the same mother tongue as the learners. It can also be concluded from the results of this study that teachers spoke to students mostly in Oshiwambo when they were outside the classroom. The study also found that there were inconsistencies in the findings related to the prevalence of code switching in the Junior Secondary Physical Science classrooms in the Oshana Education Region from all the three research tools. These were evident from the different prevalence rates of code switching that were found by the different data collection instruments employed in this study. The researchers recommend the Ministry of Education to acknowledge that code switching is prevalent in the Junior Secondary Physical Science classrooms. The Ministry needs to formulate a policy that will guide the use of code switching in the Junior Secondary Physical Science classrooms as well as guidelines on how the teachers should handle code switching in the learners' answers in the national examinations. This study also suggests that there is a need for similar studies to be carried out in the other Education Regions so as to determine the prevalence of code switching at the national level in order to take actions that will benefit all schools in Namibia.

Keywords

Code Switching, English, Prevalence, Physical Science, Teachers, Classroom Language, Lessons, Observation, Interview, Mother Tongue

1. Introduction

The Ministry of Education and Culture's (MEC, 2000) Language Policy states that the medium of instruction in Namibian schools would be English in all subjects excluding languages from Grade four through to the tertiary level. In the case of Grades one to three, the home language, any other national language can be the medium of instruction, with English as a subject. Some of the goals of this Language Policy are: 1) For the seven-year primary education phase to enable learners to acquire reasonable competence in English and to be prepared for the English medium of instruction throughout the secondary phase. 2) For the education to promote the language and cultural identity of learners through the use of mother tongue as the medium of instruction in Grades 1 - 3 and the teaching of mother tongue as a subject throughout formal education.

However, it seems as if the Language Policy was misunderstood as the extract from the discussion document of the Namibian Language Policy points out:

> …it was not explicitly outlined how national languages (or mother tongues) should be used in schools. There were discrepancies in the implementation of the Language Policy from region to region, as policy implementers, due to misinterpretation and manipulation mainly preferred teaching through

> English rather than through the mother tongue. Formerly disadvantaged learners were further marginalised in this process, as non-English speaking teachers were expected to teach through the medium of English (Ministry of Education and Culture (MEC), 2000: p. 201).

Although the policy mentions that national languages will continue to be taught as subjects throughout the school system, it does not mention anything about these national languages being used simultaneously with English in the subjects other than the language subjects. In other words, the national Language Policy does not directly address code-switching despite the fact that the majority of the Namibian population are not first-language speakers of English.

Wolfaardt (2005) points out that there is a big problem with the English language proficiency of most teachers in Namibia and as a result, learners who are taught by such teachers will not have the necessary foundation on which to build their English language skills. She, further, adds that teachers in schools make use of code switching to ensure meaningful learning takes place, especially in monolingual classes comprising of learners who have come to school for the first time and are confronted with English. Other studies (Mouton, 2007; Brock-Utne, 2001; Holmarsdottir, 2000) also point out that the English proficiency of the teachers in Namibian schools is poor.

The Junior Secondary Certificate (JSC) examiners' reports from the Ministry of Education (MoE) (2005, 2006, 2007, 2008, 2009) have indicated that the learners' poor English practices such as incorrect use of terminology, incorrect spelling of keywords, writing explanations that are not concise and to the point, failing to understand and responding incorrectly to the action verbs have badly affected their performance. These reports also reveal that code switching is a common practice amongst learners in Namibia. It is recommended that learners need to be reminded that they should answer only through the medium of English (MoE, 2008, 2009). "Switching to other languages should be avoided at all times" (MoE, 2009: p. 182).

2. Statement of the Problem

The examiners' reports for the national JSC examinations have indicated that the learners' poor proficiency in English has been adversely affecting their performance in Physical Science (MoE, 2005, 2006, 2007, 2008, 2009). These reports have also indicated that these learners answer some questions in languages other than English (i.e. they code switch when they are writing examinations) when they are fully aware of the medium through which they are supposed to answer.

Another setback is the poor proficiency in English of the teachers which in turn is likely to affect their ability to communicate effectively with their learners (Brock-Utne, 2001; Holmarsdottir, 2000; Mouton, 2007; Wolfaardt, 2005). The teachers' vocabulary, pronunciation, inflection and general command of the English language and their confidence in speaking and addressing the learners are at the core of the language use in the classroom. Consequently, the teachers'

proficiency would in the end affect the teaching and learning of Physical Science as it is taught through English as a medium of instruction.

This study, therefore, sought to find out the extent to which code switching is used in the Junior Secondary Physical Science classrooms, and the reasons for code switching as well as the advantages and disadvantages of code switching.

This study sought to answer the following research question:

What is the prevalence of code switching in the Junior Secondary Physical Science in the Oshana Education Region?

3. Theoretical Framework

The constructivism theory of learning was used for this study to explain how learners made sense of the Physical Science subject matter that was presented to them. As a learning theory, constructivism emphasizes the idea that learners develop their own understandings that make sense to them and that they do not simply receive knowledge from an outside source (Schunk, 2000). Language is not only crucial to learning, but it is also crucial to the process of thinking because people think, rationalise and make sense out of events through language (Davey & Goodwin-Davey, 1998). The researcher was interested in studying how the participants handled the language used in their classrooms, particularly the code switching phenomenon.

According to Duit and Treagust (1995), constructivism does not deny a reality outside an individual, but rather claims that in order to understand this reality the learner needs to construct or create his or her own knowledge on the basis of the knowledge that he/she already has. This study undertook to gain some insight into how the respondents handle code switching to facilitate meaningful constructs of Physical Science by their learners.

Lee (2005) recommends that learners, irrespective of their backgrounds should be provided with academically learning opportunities that let them explore scientific marvels and construct scientific meanings based on their own linguistic and cultural experiences. Learning science with understanding may, therefore, be enhanced by taking cognisance of the learners' languages and culture by providing them with some local examples as well as by relating to some of the scientific concepts in the learners' languages. In this way, science would not be too abstract for the learners and they would as a result be able to construct meaning from what they learn in the Physical Science classrooms.

4. Literature Review

4.1. Code-Switching and the Namibian Language Policy

Code-switching, according to Fromkin, Rodman, and Hyams (2007), refers to switching back and forth between two languages in a conversation. Science, typically, emphasizes vocabulary and abstract thought and as a result, English second language learners may, particularly, find Science difficult (Settlage & Southerland, 2007). Many of the concepts e.g. gravity, force, energy, and many

others in science do not have equivalent terms in the vernacular languages e.g. in Oshiwambo. This, at times, makes it hard for the students to understand such concepts. In some cases, the teachers resort to explaining the concept by giving examples of its occurrence or its applications in a mother tongue or ask one of the students to explain to her/his peers in their mother tongue.

According to Setati, Adler, Reed, and Bapoo (2002), the majority of the teachers in South African schools work in classrooms where English is officially the language of learning, but is not the main language of either the teachers or the learners. As a result, Mathematics and Science teachers faced the double challenge of teaching their subject in English while the learners are still learning this language (Setati et al., 2002). In Namibia, English is a second language to most of the learners and teachers, as their home language is usually not English. One may have observed from the streets that in Namibia, people usually speak to each other in their home languages and they only tend to speak in English or Afrikaans to people that do not share the same home language. A similar situation can be imagined in the schools.

A similar point of view is voiced by Probyn, Murray, Botha, Botya, Brooks, and Westphal (2002) as cited in Probyn (2005: p. 1856) that in schools where teachers and learners share a common home language, "the lingua franca amongst teachers and learners is their common home language, with the use of English being confined to the classroom." Probyn (2005) further states that in such classrooms, students have a tendency of using their home language with their classmates as well as in group discussions. Students also tend to use their home language with the teacher, depending on the teacher's attitudes and/or views on the matter. However, the use of English is reinforced from time to time because the teachers are aware that it is the medium of instruction.

Wolfaardt (2005) noted that many learners fail to attain the minimum language proficiency in English before the introduction of linguistically and cognitively more demanding English-medium subjects in Grade 4. "As a result of problems beginning at primary school, learners continue to lag behind their required level of language proficiency and the majority never really reach the language proficiency in English, which their age and school level demand" (Jones, 1996 cited in Wolfaardt, 2005: p. 2359). Most students and possibly a few teachers do not have much confidence when they use English, either in writing or in speaking. As a result, one finds students talking to each other in their home language even when they are in class (especially when they are working in groups or simply asking their classmates for something) where English is the medium of instruction.

4.2. Prevalence and Reasons for Code Switching

As mentioned earlier, research has pointed out that the teachers' poor English proficiency adversely affects learning by teaching through the English medium (Brock-Utne, 2001; Holmarsdottir, 2000; Mouton, 2007; Wolfaardt, 2005).

Grammar is highlighted as one of the weakest areas when it comes to general language proficiency of Namibia's teachers which could be detrimental to the learners' learning (Wolfaardt, 2005). The teachers' low level of proficiency is cited to be one of the reasons why code switching is widespread in Namibian classrooms (Holmarsdottir, 2000; Mouton, 2007; Wolfaardt, 2005).

The Ministry of Education's JSC examiners' reports on Physical Science for the past years have indicated that the students' command of the English language is still poor (MoE, 2006, 2007, 2008, 2009, 2010). Some of the comments in these reports regarding the students' lack of proficiency in English reveal that learners struggle to clearly express themselves in English, especially in answers requiring explanations. The examiners' reports, further, mention the learners' misspellings of chemicals and elements, even when they are given or listed and that learners fail to follow the given instructions when they write examinations. It is also revealed that the learners' poor proficiency in English at times causes the learners to code-switch.

> It has to be mentioned that in many cases the command of English as the medium of response to the question paper was insufficient. Switching to another language within the answers is not of much use (not all examiners and markers know all languages spoken by candidates) as attempts to translate the answers provided were in vain. All candidates should be instructed to use only English. They should practice writing and be controlled on the quality of their writing and speaking in class in order to practice the correct use of scientific terminology (Ministry of Education and Culture (MEC), 2000).

The above extract from one of the national Grade 10 examination reports bears testimony that code switching is widespread in Grades 8 - 10 classrooms in some parts of Namibia. The code switching in this scenario is attributed to the English language proficiency of the learners. Learners from the lessons and tests that they write are ought to be aware of the language that they are supposed to use in examinations. Despite this fact, it appears that learners succumb to code switching if they cannot put some of their thoughts into English when writing examinations. This is also an indication that code switching is used by learners as an alternative way of expressing their thoughts when they fail to do so in the medium of instruction.

Besides the reasons mentioned earlier; which are based on the linguistic competencies of teachers and learners, many studies (Ashton et al., 2009; Mouton, 2007; Probyn, 2005; Setati et al., 2002; van der Walt, Mabule, & de Beer, 2001; Wolfaardt, 2005) have given the following as some of the reasons why teachers use code switching in their classrooms: to explain new words, to discipline the learners and for affective purposes; such as praising the learners or joking with the learners.

It is not known if the challenges that force teachers to code switch are also experienced by the teachers in the Oshana Education Region. Therefore, if a simi-

lar situation exists in the Oshana Education Region, there would be a need to establish the extent to which this phenomenon is practised by the Junior Secondary Physical Science teachers in the region and their reasons for code switching.

5. Methodology

This study adopted a mixed research design where both the qualitative and quantitative research approaches and techniques were collectively employed to collect data from the participants. Mixed research is renowned for its ability to combine the strengths of both qualitative and quantitative research designs (Johnson & Christensen, 2008; Lodico, Spaulding, & Voegtle, 2006; McMillan & Schumacher, 2006). To be more specific, the triangulation method was used in this study. Triangulation is the term given when the researcher seeks convergence and corroboration of results from different methods studying the same phenomenon" (Johnson & Christensen, 2008: p. 451).

The researchers tried to find irregularities in the data collected via different methods to see whether the same pattern keeps recurring (McMillan & Schumacher, 2006). In this study, the data were collected by means of quantitative and qualitative data collection instruments, namely observations, questionnaires and interviews. Furthermore, the data which were obtained from different participants from different schools were collected and analysed at the same time to see if they yielded similar results. The researchers, hence, hoped that the use of triangulation might help increase the reliability of the research findings of this study. The population of this study consisted of all the Physical Science teachers for Grades 8 - 10 in the Oshana Education Region. The sample of this study consisted of 22 Physical Science teachers who taught at the Junior Secondary phase, i.e. grades 8 to 10 from ten Junior Secondary schools in the Oshana Education Region.

A combination of stratified sampling technique and convenience sampling was used for this study to select the sample. The subgroups that the researcher identified were based on their locations namely; 1) schools in and around Ondangwa, 2) schools in and around Ongwediva and 3) schools in and around Oshakati. Convenience sampling involves a selection of research participants on the basis of being accessible or expedient (McMillan & Schumacher, 2006). All accessible Junior Secondary Physical Science teachers from the selected schools in the identified strata were conveniently chosen for the study. The researcher, observation schedule, Standardised open-ended interviews, Questionnaires.

An ethics clearance certificate was sought from, and granted by the UNAM Research Ethics Committee (UREC). Permission to carry out this study was sought from the Ministry of Education through the Permanent Secretary and the Oshana Regional Director of Education. Letters were written to the Principals and the teachers of the 8 selected secondary schools to seek permission to do the research at the selected schools. The researchers then observed two lessons for 12 (54.5%) of the participants. The researchers observed two lessons for 12

(54.5%) of the participants. During the lesson observations, the researchers recorded on the observation sheet all the information that they considered relevant to the study; such as occurrence of code switching, learner-to-learner communication, learner-to-teacher communication, etc. A mixed questionnaire was designed for this study. The questionnaire that was employed in this study was a combination of open-ended and closed-ended questions. The researchers prepared standardised open-ended questions for the interview. Twenty (90.9%) of the 22 teachers were interviewed whereas the two remaining teachers did not want to be interviewed and thus were not interviewed. The respondents were asked the same eight open-ended questions, with a few probes for the responses that the researchers found unclear or incomplete. The researchers tape-recorded these interviews in addition to taking notes to ensure that the researcher captured the interviewees' responses as accurately as possible.

A pilot study was carried out with two teachers from two different schools (one teacher from each school) in Oshana Education Region who were not part of the main study. The researchers observed three Physical Science lessons of one class for each of the two teachers in the pilot study. Unnecessary, difficult or ambiguous questions were identified and therefore were not included in the final instruments. The information obtained from the pilot testing was used to improve the instruments whereby pitfalls and errors that could have proven to be costly in the study were identified in the pilot testing and eliminated from the instruments.

Descriptive statistics were used to analyse the quantitative research data of the study. The researcher used percentages to indicate the frequency of various responses expressed by the respondents. The researcher also arranged the quantitative research data into tables, histograms and bar graphs in order to present the key features of the research data in a more interpretable manner (Johnson & Christensen, 2008). The qualitative data was analysed by means of content analysis. Content analysis is a method that involves comparing, contrasting and categorizing data in order to draw meanings from the data (Gall et al., 2007). The researcher grouped the responses into themes pre-determined by the research questions namely: Prevalence of code switching, reasons for code switching. Patterns were then looked for from the responses under each theme and such patterns were coded by making a frequency count of each of the occurrence of each coding category in responses to open-ended items' responses (Gall et al., 2007).

Descriptive statistics were then used to summarise these frequency counts into tables and bar graphs. Permission to carry out this research was sought and granted by the Permanent Secretary (PS) of the Ministry of Education and from the Director of the Oshana Education Region. The researchers informed the participants about the nature of the research. They were also given a consent form to sign to assent to take part in the study. Participants were also informed that they were free to withdraw from the research at any time. Researchers were also assured that they will remain anonymous and that their information will be

treated with utmost confidentiality. participants were assured anonymity would be upheld throughout the study.

6. Results

The results are presented into one theme as follows.

6.1. Theme 1: Prevalence of Code Switching in Junior Secondary Physical Science Classrooms

The research findings about the prevalence of code switching were presented in the following order: Firstly, the findings of the Observations were presented and discussed. These were followed by the presentation and discussion of the interviews and those of the questionnaires.

6.1.1. The Prevalence of Code Switching during the Lesson Observations

1) Class size

Of the 12 classrooms that were observed, seven (58.3%) were found to be smaller classes with the number of learners ranging from 25 to 29. The remaining five (41.7%) had relatively large class sizes; ranging from 30 to 36 learners.

It was found that code switching was practised by four (80%) of the five teachers who had larger classes. Only three (43%) of the seven teachers that had smaller classes code switched. According to Martin, Sexton, Wagner and Gerlovich (1997), smaller class groups are easier for teachers to try and improve understanding, to monitor problem solving and to create an atmosphere of scientific enquiry. To achieve the same for larger classes, teachers might have to employ different approaches such as code switching.

2) Learners vs teachers' mother tongue

The mother tongue for 19 of the 22 respondents (86.4%) was Oshiwambo, for (4.5%) of the respondents it was Silozi and the remaining two respondents (9.1%), it was Hausa (from Nigeria) and Tagalog (from Philippines) languages, see Figure 1. It should be noted that Oshiwambo was the mother tongue of all the learners in the observed classrooms.

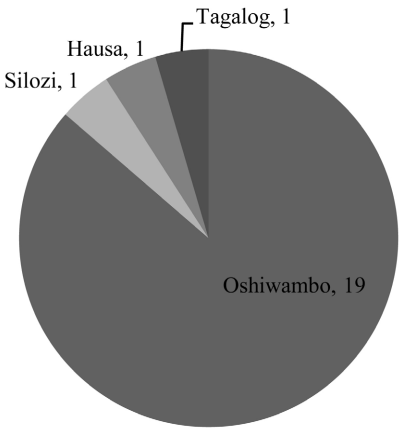

Figure 1. Teachers' mother tongues (N = 22).

Code switching was more prevalent in the classrooms where teachers had the same mother tongue as the learners. This was to be expected because these teachers and learners were well conversant in their mother tongue; unlike the teachers whose mother tongue was different from the learners' and thus had limited knowledge of the learners' mother tongue. Interestingly, the teachers whose mother tongue was different from the learners still found a way of bringing Oshiwambo words into their discussions with the learners in their lessons. They did this by asking the learners to translate some of the Physical Science terms to others or by uttering one- or two-word phrases in Oshiwambo for example; "*Aaye*!" [No!] or "*Kalunga kandje*" [my God].

3) Teachers' and learners' verbal interactions

In 75% of the observed classrooms, English was the main language of instruction during the lessons. However, it was interesting to observe how some teachers, occasionally, switched to Oshiwambo when they were teaching and when they were communicating issues that were not directly part of their Physical Science lessons. For example, a teacher asking if the learners had cleaned the class: "*Omwa komba ngaa*?" after which the teacher simply went back to the lesson's deliberations in English.

Teachers also spoke to students mostly in Oshiwambo when they were outside the classroom, for instance, when the learners submitted their books at the office or even when they asked questions about what they had learnt during the lesson. For example, a learner that collected the exercise books for the whole class handed them to the teacher saying: "*Miss onda eta omambo*" [I have brought the books Miss].

4) Teachers' code switching

During the classroom observations, the researcher concentrated on the extent to which the teachers' code switched over the entire lesson. The observations were recorded on a 4-level scale: *Almost every time* (teacher mixed English and mother tongue in almost every sentence per lesson), *sometimes* (teacher spoke mother tongue words once after every five to six sentences but spoke more in English than in Oshiwambo in the lesson), *rarely* (teacher spoke one to five words in mother tongue per lesson) and *never* (teacher spoke only in English throughout the lesson). The researcher recorded the teachers' frequency of code switching during the lesson observations in Figure 2.

Figure 2 shows that in 41.67% of the lessons observed, the teachers only used English. Generally, code switching was prevalent in 58.33% of the observed classrooms; comprising 25% lessons where the teachers code switched almost every time, 16.67% of the teachers' code switched sometimes. These teachers used mother tongue when they repeated questions or explanations and when they communicated general ideas to the learners and another 16.67% of the observed classrooms, where the teachers' code switched rarely. These teachers mainly used one-word phrases to discipline and call for the learners' attention e.g. "*hey kamatyona*" [hey young boy]. The non-Oshiwambo-speaking teachers

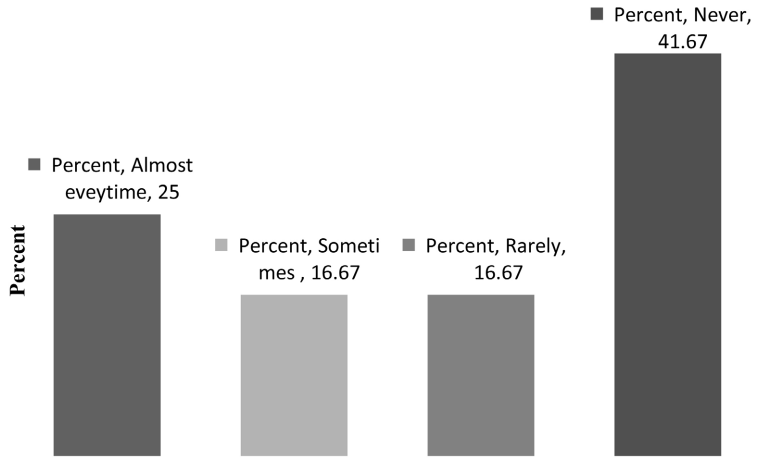

Figure 2. Teachers' code switching during the lesson observations (N = 24).

predominantly used this level of code switching to call for the learners' attention and to express their feelings e.g. "*meme*" [meaning mother, used in this context to express surprise] and "*Kalunga kandje*" [my God].

The classroom observations revealed that code switching was prevalent in Grade 8 - 10 Physical Science classrooms in the Oshana Education Region. The prevalence of code switching during the classroom observations in this study was found to be higher than the 37% prevalence that Mouton (2007) found during her study. This might be due to the fact that the learners in the observed classrooms of this study all spoke the same mother tongue and that the majority (86%) of the teachers spoke the learners' mother tongue.

Although the participants were assured of the confidentiality and anonymity of their identities in the study, the researcher noticed that the teachers might not have taught as they would have normally done with an outsider in their classrooms. After ignoring the learners' Oshiwambo comments and questions by responding in English, one teacher specifically cautioned her learners: "*Anyway, we normally use just only to speak in English, speak in English please.*" This also sounded as a reassurance for the researcher that code switching was not an everyday occurrence in that classroom. The fact that the learners constantly spoke to the teacher in Oshiwambo made the researcher to think that Oshiwambo was usually used in that classroom. As Mouton (2007) found in her study, the teachers appeared to resist code switching. The results from the observations reflected a lower code switching prevalence than the results from the questionnaires and interviews. In this study, there were also discrepancies between the teacher observations and their responses in the questionnaires and interviews regarding the prevalence of code switching.

Thirteen percent of the teachers seemed to be uncomfortable with having their lessons observed. These teachers avoided having their lessons observed by giving reasons such as: "*I am not teaching Grades* 8 - 10 *learners today and I will not be around tomorrow*", "*my students will be writing a test and I have covered the whole syllabus already*". Two of the 12 observed teachers conducted experi-

ments during each of their two observed lessons. The researcher found it rather unusual for the teacher to conduct two different practicals in two consecutive lessons, especially when none of the other observed teachers conducted even a single experiment.

Furthermore, by the time the observations were done, the teachers were well aware of what the study was about from the consent forms as well as from the questionnaires that were handed to them prior to the classroom observations. This might have led the teachers to change their usual code switching practises in order for them to appear correct to the researcher. Hence, the findings about the prevalence of code switching from classroom observations might not be that accurate.

5) Other observations:

The researcher also noted the following in the observations:

a) The learner-to-learner verbal interactions during the lessons were mainly in the mother tongue. This might be due to the fact that the learners had the same mother tongue, which naturally would be their language of communication.

b) The teacher-to-learner verbal interactions during the lessons were mainly in English. Once outside the classroom, including in the teachers' staff room, Oshiwambo became the dominant language of interactions. In addition, the teacher-to-teacher conversations were in Oshiwambo as well. This could be due to the fact that the teachers, as well as the learners, shared the same mother tongue.

c) It was also observed that during the Physical Science lessons, the learners discussed amongst themselves in Oshiwambo, without any objections from the teachers.

d) The learners in the classrooms, where the teachers used Oshiwambo, were more active than those that were in the classrooms where the teachers did not code switch.

e) When the teachers and/or learners wrote on the chalkboard, they only used English.

This study, like some other studies (Ashton, Iijambo, Matengu, & Kalenga, 2009; Wolfaardt, 2005) found that English in many Namibian schools played the role of the official language of instruction but it is not yet a lingua franca. Teachers and learners alike were observed to use English for the official tasks, which mostly happened in the classrooms like when writing summary notes, questions and/or answers on the chalkboard, for the written activities and when asking subject-related questions during the lessons. Some activities that took place in the classrooms were also treated as non-official and hence more Oshiwambo was used then. For example, when the teachers joked with or teased the learners, as well as when the teachers communicated general things with the learners like asking whether the class was cleaned or when sending the learners, to bring things the teachers had left at the office. Activities that took place outside the classroom were treated more informally and hence more code switching

was used irrespective of what was being discussed was related to the deliberations of the lesson or not.

6.1.2. Prevalence of Code Switching from the Questionnaires and Interviews

The teachers were asked in the questionnaire to indicate how often they code switched in an average Physical Science lesson. The respondents had to choose from the following responses: "Never", "Rarely", "Sometimes" and "Almost every time". The respondents' answers are given in Figure 3.

Figure 3 shows that in total, 77.3% of the respondents stated that they code switched in an average Physical Science lesson. About 46% of the teachers indicated that they code switched "sometimes", 22.7% said that they "never" code switched and 9.1% indicated that they code switched "almost every time" in their Physical Science lessons. None of the respondents indicated that they code switched every time.

During the interviews the respondents were asked to respond to the question: *Can you briefly explain the extent to which you practice code switching in your Physical Science lessons*? The respondents provided detailed answers, which the researcher coded into the following categories: *Common*, *sometimes*, *rare*, *very rare and never*. The participants' responses are summarized in Figure 4.

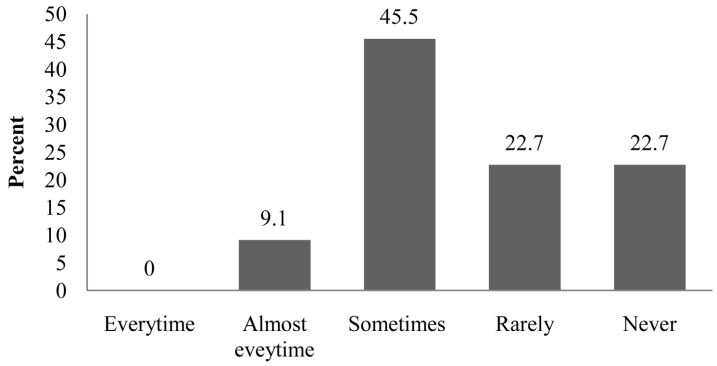

Figure 3. Teachers' code switching from questionnaires (N = 22).

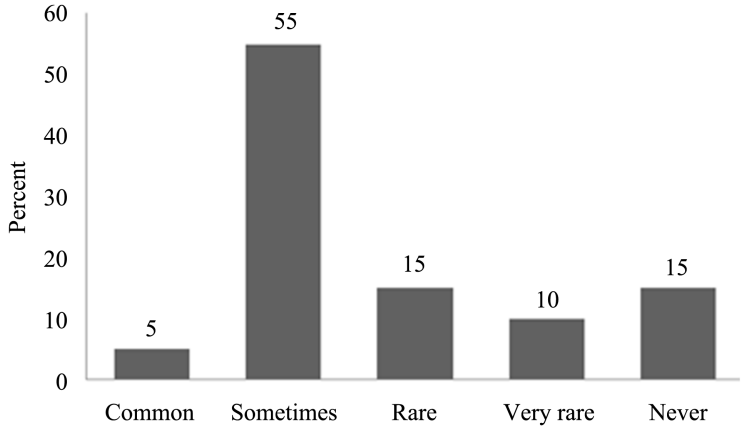

Figure 4. Teachers' code switching from interviews (N = 20).

It was found from the interviews that 85% of the participants admitted that they code switched in their Physical Science lessons. The most popular response was given by 55% of the participants that indicated that they code switched sometimes during their Physical Science lessons. Some of the responses that indicated the prevalence of code switching were:

> "Only sometimes, we find especially in some topics which are so difficult even myself I do not understand them to explain them thoroughly English. I try to switch to explain them in Oshiwambo to make them clear."
> "It is used in sometimes but not every time because some of the concept in Physical Science you can't explain using mother tongue."
> "Eh, not too much. Sometimes you can see that the learners do not understand when you are explaining in English."
> "Sometimes I use to speak during the lesson in a language that they can understand for instance Oshiwambo…"
> "Eh, anyway normal we don't mix languages but we find it to some learners. If they don't understand, we have to mix the language like Oshindonga now. But not whole lesson you are just using Oshiwambo, only some few words…"

However, three (15%) of the participants indicated that they only used English in their Physical Science lessons and no other language. These respondents admitted that code switching was not a strange phenomenon in their classrooms altogether as learners in their Physical Science lessons practise it. Their responses were as follows:

> "It is not really common, in my lessons. I do not code switch. I only use English. My learners mostly use English and that's how they know me. Even they meet me outside they know they can only speak to me in English. I have noticed that they use Oshiwambo like in group work but as soon as I walk to their group, they change back to English."
> "During the lessons, I only use one language which is English. So to me for the benefit of my learners I do not think if it is important to mix the languages and yet the subject itself is in English."
> "With me I don't switch to my mother tongue because number one, I was never taught in my mother tongue so… and Physical Science terminology sometimes is very difficult to find in Oshiwambo. You may find learners looking for a word amongst themselves; they translate it into the mother tongue."

The data therefore established that the Physical Science teachers code switched to different degrees. Some code switched almost every time, others code switched sometimes, some code switched rarely while others did not code switch at all. About 42% of the respondents did not code switch at all in their lessons during the observations, 15% indicated that they never code switched during the interviews and 22.70% said that they never code switched in the questionnaires.

The prevalence of code switching in this study was found to be 58.33% from the observations (see **Figure 2**), 70% from the questionnaires (see **Figure 3**) and 85% from the interviews (see **Figure 4**). The findings of the study regarding the prevalence of code switching in the Junior Secondary Physical Science classrooms of the Oshana Education Region from the three data collecting instruments were inconsistent. The findings from the interviews indicated the highest prevalence of code switching and the findings from the observations recorded the lowest prevalence for the study.

The researcher anticipated the questionnaires to indicate a higher prevalence rate of code switching since the respondents answered the questions in the absence of the researcher and the respondents' responses would have been expressed privately, in the absence of the researcher. The lower prevalence of code switching during the observations could be attributed to the teachers' and learners' reactions to the presence of the researcher in the lessons. The results from the interviews regarding the prevalence of code switching may be more reflective of what really happens in the Junior Secondary Physical Science classrooms in the Oshana Education Region compared to the results gathered through the lesson observations and questionnaires. Interviews are renowned for their ability to obtain information that the respondent might not reveal by any other data collection method (Gall et al., 2007). It might be that the respondents were able to come out with the information related to the prevalence of code switching more openly, perhaps due to the relationship that the researcher had established with them.

7. Conclusion

The results of this study revealed that code switching was relatively prevalent in Grade 8 - 10 Physical Science classrooms in the Oshana Education Region. It can be concluded from this study that the Physical Science teachers' code switched to different degrees, some code switched almost every time, others code switched sometimes, some code switched rarely while others did not code switch at all. The prevalence of code switching in this study was found to be 58.33% from the observations, 70% from the questionnaires and 85% from the interviews.

From the observation results of this study, it can be concluded that teachers with larger classes code switching more than those teachers that had smaller classes. It can also be concluded from the observation results that code switching was more prevalent in the classrooms where teachers had the same mother tongue as the learners.

In 75% of the observed classrooms, English was the main language of instruction during the lessons. It was observed that some teachers, occasionally, switched to Oshiwambo when they were teaching and when they were communicating issues that were not directly part of their Physical Science lessons. It can also be concluded from the results of this study that teachers spoke to students mostly in Oshiwambo when they were outside the classroom.

The practice of code switching was attributed amongst others to the following: the learners' and at times teachers' insufficiency of the required English language proficiency, promotion of understanding, contextualising the Physical Science content, classroom management and for expressing emotions. It was also found that few teachers did not code switch in their Junior Secondary Physical Science lessons because the national Language Policy and the subject policy did not prescribe the use of code switching. Furthermore, if the learners' code switched in the national examinations their performance would be adversely affected. The findings of the study regarding the prevalence of code switching in the Junior Secondary Physical Science classrooms of the Oshana Education Region from the three data collecting instruments were found to be inconsistent. The findings from the interviews indicated the highest prevalence of code switching and the findings from the observations recorded the lowest prevalence for the study.

8. Recommendations

In light of the above findings, the following recommendations are made:

- The Ministry of Education needs to acknowledge that code switching is prevalent in the Junior Secondary Physical Science classrooms. The Ministry needs to formulate a policy that will guide the use of code switching in the Junior Secondary Physical Science classrooms as well as guidelines on how the teachers should handle code switching in the learners' answers in the national examinations.
- The University of Namibia, as the main teacher training institution in Namibia, needs to integrate the issue of code switching into the teaching methodology courses in order to prepare the student teachers for the realities that await them in the classrooms.

9. Areas of Further Research

- There is a need for similar studies to be carried out in other Education Regions so as to determine the prevalence of code switching at the national level in order to take actions that will benefit all schools in Namibia.
- Learners were not included in the sample of this study. It is recommended that other researchers conduct studies that will include the learners.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

Ashton, D., Iijambo, T., Matengu, M., & Kalenga, E. (2009). *Implementation of the Government of the Republic of Namibia's Language Policy for Schools in Selected Primary Schools in Windhoek: A Study Conducted by the University of Namibia.* The University of Namibia.

Brock-Utne, B. (2001). Editorial Introduction. *International Review of Education, 47,*

163-184. https://doi.org/10.1023/A:1017912706119
http://www.jstor.org/stable/3445339

Davey, C., & Goodwin-Davey, A. (1998). Teaching for Language and Cognition. In N. Kruger, & H. Adams (Eds.), *Psychology for Teaching and Learning: What Teachers Need to Know* (pp. 165-178). Heinemann.

Duit, R., & Treagust, D. F. (1995). Students' Conceptions and Constructivist Teaching Approaches. In B. J. Fraser, & H. J. Walberg (Eds.), *Improving Science Education* (pp. 46-69). The National Society for the Study of Education.

Fromkin, V., Rodman, R., & Hyams, N. (2007). *An Introduction to Language* (8th ed.). Cengage Learning.

Gall, M. D., Gall, J. P., & Borg, W. R. (2007). *Educational Research: An Introduction* (8th ed.). Allyn & Bacon.

Holmarsdottir, H. (2000). *From Policy to Practice: A Study of the Implementation of the Language Policy in Namibian Primary Schools.* Ph.D. Thesis, University of Oslo.

Johnson, B., & Christensen, L. (2008). *Educational Research: Quantitative, Qualitative and Mixed Approaches* (3th ed.). Sage Publications.

Lee, O. (2005). Science Education with English Language Learners: Synthesis and Research Agenda. *Review of Educational Research, 75,* 491-530. https://doi.org/10.3102/00346543075004491

Lodico, M. G., Spaulding, D. T., & Voegtle, K. H. (2006). *Methods in Educational Research: From Theory to Practice.* Jossey-Bass.

Martin, R., Sexton, C., Wagner, K., & Gerlovich, J. (1997). *Teaching Science for All Children* (2nd ed.). Allyn & Bacon.

McMillan, J.H., & Schumacher, S. (2006). *Research in Education: Evidence-Based Inquiry* (6th ed.). Allyn & Bacon.

Ministry of Education (MoE) (2005). *Circular: DNEA 69/2005: Report on the Examinations: JSC October/November 2004.* MoE.

Ministry of Education (MoE) (2006). *Circular: DNEA 78/2006: Report on the Examinations: JSC October/November 2005.* MoE.

Ministry of Education (MoE) (2007). *Circular: DNEA 50/2007: Report on the Examinations: JSC October/November 2006.* MoE.

Ministry of Education (MoE) (2008). *Circular: DNEA 34/2008: Report on the Examinations: JSC October/November 2007.* MoE.

Ministry of Education (MoE) (2009). *Circular: DNEA 50/2009: Report on the Examinations: JSC October/November 2008.* MoE.

Ministry of Education and Culture (MEC) (2000). *Towards Education for All: A Development Brief for Education, Culture and Training.* Gamsberg Macmillan.

Mouton, B.D. (2007). *The Simultaneous Use of Two or More Media of Instruction in Upper Primary Classes in the Khomas Educational Region.* MSc. Thesis, The University of Namibia.

Probyn, M. J. (2005). Learning Science through Two Languages in South Africa. In J. Cohen, K. T. McAlister, K. Rolstad, & J. MacSwan (Eds.), *Proceedings of the 4th International Symposium on Bilingualism* (pp. 1855-1873). Cascadilla Press. http://www.lingref.com/isb/4/145ISB4.PDF

Schunk, D.H. (2000). *Learning Theories: An Educational Perspective* (3rd ed.). Prentice Hall.

Setati, M., Adler, J., Reed, Y., & Bapoo, A. (2002). Incomplete Journeys: Code-Switching

and Other Language Practices in Mathematics, Science and English Language Classrooms in South Africa. *Language and Education, 16,* 128-149.
https://doi.org/10.1080/09500780208666824
http://www.mamokgethi.com/pdf/17pub.pdf

Settlage, J., & Southerland, S. A. (2007). *Teaching Science to Every Child: Using Culture as a Starting Point.* Routledge.

Van der Walt, C., Mabule, D. R., & de Beer, J. J. (2001). Letting the L1 in by the Back Door: Code Switching and Translation in Science, Mathematics and Biology Classes. *Journal for Language Teaching, 35,* 170-181. http://www.saalt.org.za/jour35-2&3.htm

Wolfaardt, D. (2005). Namibia: A Case for a Gradual Transitional Bilingual Language Programme. In J. Cohen, K. T. McAlister, K. Rolstad, & J. MacSwan (Eds.), *Proceedings of the 4th International Symposium on Bilingualism* (pp. 2357-2368). Cascadilla Press. http://www.lingref.com/isb/4/184ISB4.PDF