Influence of an African Indigenous Language on Classroom Interactions and Discourses

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Abstract: This qualitative interpretative case study aimed to investigate how the developed isiNdebele scientific language register for Natural Sciences influences learners’ classroom interactions and discourses. Data were collected from stakeholders through interviews and observations. The results indicated that the use of African indigenous languages positively shapes learners’ classroom interactions and discourses. Specifically, when learners were taught Natural Sciences using the isiNdebele register, there was maximum interaction in the classroom in contrast to using the English register, where learners were passive for most of the lesson. This highlights the need for developing scientific registers in African indigenous languages. Therefore, it is recommended that these registers be integrated into teaching and learning as they positively influence interactions and discourses, leading to meaningful learning and better performance.

Keywords: isiNdebele; scientific language register; natural sciences; classroom interactions and discourses

1. Introduction

South Africa is a multilingual country both in its legislation and language practices. This is evident in the South African Constitution [1], which recognizes twelve official languages, including sign language, with nine of these being indigenous [2]. These languages are used interchangeably by various people in daily interactions. Most South Africans speak more than one language, often three or more. However, the official business of the country is primarily conducted in English, and in smaller towns and provinces, in Afrikaans [2].

The global dominance of English has infiltrated the South African education system from the beginning, despite the country’s inherent linguistic diversity [3]. English is seen as a key enabler for international mobility and a powerful tool for linguistic superiority and economic benefits [4]. However, the predominance of English as an international language has raised concerns about its negative impact on the South African education system [5]. Critics argue that this limits the role of African indigenous languages in education and poses a threat to their survival [6].

The dominance of English in the South African education system forces African learners to conform to its use in classrooms, limiting their language choice and restricting the country’s linguistic diversity [7]. The implications of using English as the medium of instruction in South African schools have been extensively debated by researchers [5,8]. These studies suggest that language proficiency is a significant barrier to meaningful learning. In classrooms where English is the medium of instruction, there is often little to no interaction because if learners do not understand the language of instruction, they struggle to engage with the lesson and progress [7]. It has been noted that learners who receive instruction in their indigenous language benefit more than those who do not.

The assertions of researchers are further supported by the Minister of Basic Education Angie Motshekga [5,8]. During a parliamentary question and answer session on 9 March...
2022, she noted that one of the primary reasons for South African children’s poor reading comprehension skills is that they are essentially learning in a foreign language by being taught in English [9]. Additionally, Historian and Cultural Analyst Professor Pitika Ntuli, in an interview on eNews Channel Africa (eNCA) on 23 October 2019 about the preservation of indigenous languages, stated that in Africa, learners who are taught in their native language experience faster knowledge growth. He emphasized that being taught in an additional language can be a barrier to educational quality. Therefore, it can be inferred that African indigenous languages positively influence classroom interactions and discourses.

Current research highlights the importance of using African indigenous languages in education as an effective way to address the challenges faced by African learners when English is used as the medium of instruction [7,10]. The significance of African indigenous languages in education has led to the adoption of practices such as bilingualism, multilingualism, translanguaging, and code-switching. These practices are prevalent in South African schools, where both teachers and learners often do not speak the language of instruction [11]. They help overcome the barriers created by the medium of instruction by incorporating indigenous languages into teaching and learning. The benefits of these practices are evident in improved learner interactions and discourses, which lead to meaningful learning and better performance [11]. According to research, “for learning to take place, there needs to be interaction between learners in the classroom, and this could be facilitated by promoting the use of indigenous languages to engage and make connections that lead to high-level comprehension” [10].

According to Smart and Marshall [12], classroom discourse refers to the interactions between a teacher and learners that occur within the classroom. He noted that this interaction can take the form of spoken conversations and debates. Scott, Motimer and Aguiar [13] emphasized the importance of these teacher–learner interactions, stating that learners gain a deep understanding of subjects through questions, discussions, and arguments. Gee [14] defines discourses as connected segments of language that, when combined, convey meaning to a group of individuals.

The group of individuals referred to in this paper include the teacher and learners in a Natural Sciences classroom. Various strategies are employed to make learners feel comfortable expressing themselves to teachers. In this research, classroom interactions and discourses are defined in two ways: first, as interaction, which refers to the teacher’s engagement with the learners, and second, as discourse. According to [15], classroom interaction involves teachers and learners working closely together to explore and resolve specific scientific ideas and concepts.

Smart and Marshall [12] highlighted other aspects of classroom interaction and discourse. These interactions between teachers and learners are forms of communication, which Smart and Marshall [12] describes as different types of discourses. Mudau [15] identifies these types as authoritative discourse, dialogic discourse, and reflective discourse. Authoritative discourse involves teachers prompting learners’ answers through questions and realistic statements. Dialogic discourse encourages debate between teachers and learners to enhance understanding. Reflective discourse involves teachers engaging with learners to gather different ideas or solutions, assessing the extent of learners’ comprehension of concepts and ideas.

Classroom interactions and discourses also highlight a communicative approach [15]. There are four categories within this approach: interactive–authoritative, interactive–dialogic, non-interactive–dialogic, and non-interactive–authoritative [13]. According to Mudau [15], these approaches have specific definitions and descriptions. The interactive–authoritative approach involves teachers prompting learners for answers and dismissing them if incorrect, focusing solely on correct responses. The interactive–dialogic approach occurs during open discussions where all answers are valid, and learners’ views are considered, even if they differ from accepted scientific perspectives. The non-interactive–authoritative approach contrasts with the interactive–authoritative and interactive–dialogic methods, involving one-way communication where learners are expected to understand the
information without questioning or suggesting alternatives. The non-interactive–dialogic approach, as described by Mudau [15], allows teachers to add their own explanations beyond the formal guide to help learners better understand ideas or concepts, though learners are not invited to contribute their own inputs.

The use of African indigenous languages in interactions and discourses is considered crucial for meaningful learning and enhanced learner performance [10]. This paper specifically examines the impact of African indigenous languages, with a focus on isiNdebele, on classroom interactions and discourses. isiNdebele was selected because it is the researcher’s native language. Thus, this study is guided by the research question: What is the influence of an African indigenous language on classroom interactions and discourses?

2. Materials and Methods

2.1. The Study Group

The research approach employed in this study is qualitative, using a method of inquiry that seeks to understand central phenomena by studying participants within their context. [16] notes that a qualitative research design enables the exploration of a phenomenon in its real-life setting. In phenomenological research, researchers avoid making assumptions and instead focus on understanding participants’ experiences. This study used a multiple case-study design, as the researchers aimed to gather in-depth details from the exploration. This design enabled the researchers to treat each case individually, acknowledging the diverse backgrounds and teaching experiences of the participants [17].

Purposive sampling was used to select two Natural Sciences teachers, two groups of learners, and two parents as participants for this study. As noted by Maree [18], purposive sampling is ideal for selecting information-rich cases for in-depth study, involving participants who are knowledgeable about the phenomenon being investigated. Sampling was based on the following criteria: participants (teachers) must be teaching Natural Sciences in senior phase schools (grades 7–9), specifically within the Siyabuswa 2 circuit, and parents and learners from the selected school. Finally, only participants who were willing to take part in the study were included.

2.2. Data Collection Tools

The qualitative data collection for this study involved two strategies. The first strategy entailed one-on-one semi-structured interviews with a set of predetermined questions [16,18]. Interviews were conducted with two Natural Science teachers, two groups of learners, and two parents from selected schools to explore whether the developed isiNdebele Natural Sciences scientific language register influences learner’s classroom interactions and discourses. During these interviews, follow-up questions, such as “If yes, how? Please elaborate” were posed to seek further clarification and gather additional data.

Although interviews are often seen as time-consuming and expensive [19], this method was deemed most appropriate for data collection due to the small number of participants and the personalized nature of the interview data. Interviews allowed for the gathering of sufficient and relevant information [17]. Additionally, they provided a richer source of descriptive data than could be obtained through instruments like questionnaires [20]. Participants were interviewed during their free time and after school to explore how the developed isiNdebele Natural Sciences scientific language register influenced learner’s classroom interactions and discourses. The interviews were audio-recorded to ensure accurate capture of the participants’ responses.

The second strategy, classroom observation, proved to be an effective method for data collection in this study as it involved observing teachers as they taught Natural Sciences using both the English and isiNdebele scientific registers. Observations were conducted over a continuous three-week period to ensure the validity of the collected data. Each teacher was observed multiple times for an hour: in the first 45 min, they taught unit 1 on separating mixtures using the isiNdebele scientific register for Natural Sciences, and in the remaining 15 min, they used the English scientific register. Different times were allocated
to observe how classroom interactions and discourses varied with the use of different registers. The most suitable observation method for this study was the “observer as a non-participant” approach, where researchers remained uninvolved and did not influence the dynamics of the setting.

Interviews and observations facilitated data triangulation. The researchers cross-checked participants’ responses from the interviews with observations from the classroom to draw up the study’s findings.

2.3. Data Analysis

Content analysis was employed to analyse the data collected from interviews and observations for this study. Audio-taped interviews and observations were reviewed multiple times and transcribed into a word document. After transcribing, the researchers re-listened to the audio recordings to ensure the transcriptions accurately reflected the participants’ responses. The transcribed data from both the interviews and observations were read thoroughly, and significant statements that elucidated the participants’ views were highlighted. These statements were used to create themes and categories based on the research questions [16]. Interactions and discourses served as a central theme for analysing this study’s data.

3. Results

In this section, we present the results for two participants: Case 1, Thabo, who uses the African indigenous language isiNdebele, and Case 2, John, who uses the English language register. The focus of these results is on classroom discourses. According to Smart and Marshall [12], classroom discourses involve diverse engagements between teachers and learners, best practiced orally through discussions and debates. Mudau [15] defines classroom interactions as the close collaboration between teachers and learners to achieve meaningful learning, which is a dialogic process where various ideas are combined and reflected upon. Additionally, Scott et al. [13] underscores the importance of interactions and discourses as fundamental to meaningful learning, which positively impact learner performance. They noted that meaningful learning occurs in three phases: the social plane, where new content is introduced to learners; the internalization process, where learners are supported to understand and make sense of the new content; and the application phase, where learners use the new content. Language facilitates these phases, serving as a tool for interactions and discourses [12,15].

3.1. Case 1 (Thabo)

Thabo is a Black male teacher with a Bachelor of Education (BEd) degree in Natural Sciences, specializing in Mathematics and Physical Sciences. He has eight years of experience teaching Natural Sciences. IsiNdebele is his home language, and he teaches Natural Sciences to grades 7–9.

In exploring the use of the register, we sought to understand stakeholders’ perspectives on how the developed isiNdebele scientific language register for Natural Sciences influences classroom interactions and discourses. Thabo (a pseudonym) from school A mentioned that:

“Yes, I think it does positively influence, because the register is written in their home-language making it easier for learners to interact when they understand the language rather than when using English register where their participation is minimal”. Thabo

Thabo’s response is grounded in the belief that teaching learners in their mother tongue enhances their understanding of concepts and facilitates easier interaction, as opposed to teaching them in English. His views are supported by Adesemowo [21] and Ntuli [22], who highlighted that using an indigenous language to teach African learners enables them to better understand and relate to concepts within their own language and cultural context. When learners were also asked the same question, a learner from school A responded as follows:
“The register will have a good influence because when we learn using this register, we can participate and interact without fear because we learn using the language, we familiar with and we able to think quickly because we understand better”.

Parents were also asked the same question. A parent from school B responded as follows:

“Yes, it can influence positively because I think if they can teach Natural Science with IsiNdebele, because all learners are going to understand very well. And I think all learners in the class they are going to understand everything, and they are going to participate and interact, and they are going to get total marks. Just because they got to learn in their home languages”.

Based on the above responses, stakeholders concurred that the developed isiNdebele scientific language register for Natural Sciences can influence classroom interactions and discourses. Their views were largely centred on the advantages of using the mother tongue, which can foster meaningful learning and lead to better performance, as noted by Adesemowo [21], and is supported by political commentators like Dr. Somadoda Fikeni, traditionalists such as Zolani Mkiva, and historian and cultural analyst Professor Pitika Ntuli. These experts also affirm that learning in the mother tongue enhances learners’ interactions and discourses, contributing to meaningful learning and improved performance. The perspectives of these stakeholders are further supported by Oyoo and Nkopodi [2], which also emphasized how the use of indigenous languages can enhance meaningful learning and lead to better outcomes.

The perspectives of these stakeholders are further supported by Oyoo and Nkopodi [2], which also emphasized how the use of indigenous languages can enhance meaningful learning and lead to better outcomes.

The researchers then observed teachers and learners in the classroom to corroborate and triangulate the data collected from the interviews with the observed classroom interactions and discourses [23]. Using methods other than observation would not have been effective in capturing the nuances of classroom interactions and discourse.

During the interviews, Thabo stated that the developed isiNdebele scientific language register for Natural Sciences influences classroom interactions and discourses. Consequently, he was observed using the isiNdebele scientific register to teach Natural Sciences. He began his lesson by assessing the learners’ prior knowledge of the topic, which is crucial for meaningful learning, as noted by Keeley [24]. He mentioned that:

“What comes to your mind when you hear the word “Matter” Any view is acceptable?”

During his lesson, he employed dialogic discourse, as noted by Mudau [15], allowing learners the opportunity to engage with and discuss the content presented to them. This is supported by the following extract, where they were explaining their understanding of “matter”:

“I think matter is used to do something”. L1

“Matter is something that can take up space”. L2

When he inquired about the nature of matter, he assured his learners that all viewpoints were acceptable. This approach was interactive and dialogic, as described by Mudau [15] and Chin [25], thus encouraging learners to share any responses they had. The emphasis was not on providing correct answers but on fostering participation and interaction, with the ultimate goal of promoting meaningful learning.

He was also observed employing dialogic discourse during his lesson, as noted by Mudau [15] and Chin [25], with learners debating and discussing whether it is possible to extract salt from saltwater and, if so, what that process is called in isiNdebele. The learners’ responses below support this observation.

“Yes, through boiling” L2

“Through filtering” L3

Based on the above observations, Thabo employed not only dialogic discourse but also an interactive–dialogic approach. His learners were seen suggesting various methods for
separating a salt and water mixture. Despite some incorrect responses, he acknowledged them and provided the correct answers. Throughout his lesson, he asked questions that stimulated discussions and enhanced learners’ thinking skills. For instance, he asked questions to promote critical thinking, such as asking learners to identify and name mixtures and pure substances. This approach is illustrated by the extract below:

“Raisons are pure-substances”. L1
“Rama is a pure substance” L2
“I do not know any other name that best describes Rama in isiNdebele”. Thabo
“Yibhodoro”. L3

The teacher and learners debate that margarine is an English word, and finally agreed on “yibhodoro”.

Based on the above observations, Thabo did not ask questions merely to fill time; instead, he posed questions that encouraged the development of critical thinking skills. This was evident when learners debated the meaning of “rama” in isiNdebele, a term Thabo was unfamiliar with, as he confirmed. His learners proposed a better term in isiNdebele, “ibhodoro.” Thabo was observed using the initiation, response, feedback, response, and feedback (IRFRF) pattern of discourse as he asked open-ended, learner-centred questions [26].

3.2. Case 2 (John)

John is a Black male teacher with five years of teaching experience in Natural Sciences for grades 7–9. He holds a Bachelor of Education (BEd) degree, specializing in Natural Sciences, with a focus on Mathematics, Physics, and Chemistry. IsiNdebele is his home language.

In exploring the application of the register, we aimed to understand stakeholders’ perspectives on how the developed isiNdebele scientific language register for Natural Sciences influences classroom interactions and discourses. John (a pseudonym) from school B mentioned that:

“Yes, it will in a good way, because sometimes when they have the language barrier, they do not really ask the questions that need to be asked. Sometimes they keep quiet because they do not want to speak in the language that we are using for teaching. But using the isiNdebele register will make them interact better because they will be using their home language”. John

Based on his response, John indicated that the developed isiNdebele scientific language register for Natural Sciences positively influences classroom interactions and discourses. He noted that using the isiNdebele scientific register helps learners interact more effectively compared to when they are taught in the English scientific register. Given his comments on the English and isiNdebele registers for Natural Sciences, we decided to observe him teaching the same topic using the English scientific register.

According to Mudau [15] and Chin [25], John employed authoritative discourses from the beginning as learners were not given the opportunity to debate or discuss the concepts. He primarily transmitted information through a question-and-answer teaching method, which researchers often criticize for making learners passive and promoting superficial thinking. See the extract below:

“Why are you saying Tap water is a mixture? Because they use a chemical right?” John
“Yes” L’s
“So, we all are agreeing that tap water is a mixture”. John
“Yes” L’s

During his lesson, learners were not given the opportunity to engage, ask questions, or share their thoughts on the content being presented. John simply conveyed the information,
leaving the learners as passive recipients, which made his discourse authoritative [25]. The pattern of discourse John employed in his class was initiation, response, feedback (IRF) [26]. He was observed initiating questions about mixtures and pure substances, followed by providing feedback. This is illustrated in the extract below:

“Milk is a what? Is a pure substance right?” John

“Yes” L’s

In all instances, John did not ask questions that would facilitate discussion or stimulate learners’ critical thinking; instead, all questions were straightforward with clear answers, and he sometimes provided the answers himself. John employed an interactive–authoritative approach in his teaching. While there was some interaction between the teacher and learners, there was minimal interaction among the learners themselves. The authoritative nature of John’s teaching was evident throughout the lesson as he predominantly used lectures and a question-and-answer format, leaving learners with little opportunity to question or explore the content further. Although he invited responses from learners, he often supplied the answers to questions they could not answer. This observation is supported by the recorded notes below:

“Let us go to picture B. Picture B, what do you think of Picture B?” John

“(Mumbling)” L’s

“What you see there it is a mixture”. John

The above extracts demonstrate the authoritative nature of his communicative approach. If he had allowed learners to interact with each other and engage with the content instead of simply providing answers, he could have helped them develop various skills such as questioning and communication, as outlined in the NS CAPS document for grades 7–9. Consequently, the learners were not engaging with the teacher in a meaningful way as the register used for Natural Sciences was English.

4. Discussion

The findings of this study indicate that when Thabo used the isiNdebele scientific language register for Natural Sciences, there were significant differences compared to John’s approach. These differences can be categorized as follows in Table 1.

Table 1. Data Analysis Scheme.

<table>
<thead>
<tr>
<th>Theme 3 Categories</th>
<th>Thabo (Using African Indigenous Language Register)</th>
<th>John (Using English Indigenous Language)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The influence of the developed scientific language register for Natural Sciences in isiNdebele shape classroom interactions and discourses</td>
<td>Types of discourses</td>
<td>IRFRF</td>
</tr>
<tr>
<td></td>
<td>Patterns of discourse</td>
<td>Interactive</td>
</tr>
<tr>
<td></td>
<td>Teacher questions</td>
<td>Question and answer</td>
</tr>
<tr>
<td></td>
<td>Communicative approach</td>
<td>Interactive dialogic</td>
</tr>
</tbody>
</table>

Thabo employed dialogic discourse by providing his learners with numerous opportunities to engage with and discuss the concepts presented to them. Additionally, he fostered an environment where learners felt more comfortable interacting with him and each other as they responded to questions with ease, even if their answers were incorrect. These observations align with findings from Mudau [27]. This approach made his method interactive–dialogic. According to Mudau [28], an interactive–dialogic approach facilitates meaningful learning. Thabo used a question-and-answer teaching method to enhance thinking skills, employing the IRFRF pattern of discourse, where he provided feedback that stimulated further thinking and discussion among his learners. The integration of various types of discourses, discourse patterns, teacher questions, and communicative approaches
promotes positive interactions and discourses, leading to meaningful learning [29]. These outcomes stem from the use of African indigenous languages.

In contrast to Thabo’s use of the isiNdebele scientific register, the researchers observed that John’s use of the English scientific register for Natural Sciences did not facilitate any discussions between him and the learners or among the learners themselves. John was primarily a transmitter of information, with his learners acting as passive recipients. This teaching strategy is discouraged by researchers such as Nkanyani and Mudau [17], who argue that it does not promote meaningful learning, resulting in an authoritative discourse. Additionally, the IRF pattern of discourse John used limited learners’ opportunities to develop skills such as asking questions and scientific process skills, as outlined in the CAPS NS policy document. John’s questions were primarily aimed at evaluation rather than at developing learners’ thinking skills or allowing time for deeper engagement, a practice also criticized by Nkanyani and Mudau [17] and Mudau [27] for stifling learners’ critical thinking and creativity. The researchers noted that at the end of the lesson, learners were not given the opportunity to comment, reflect on the topic, or seek clarification on what they had learned, thus characterizing his communicative approach as “interactive and authoritative” as indicated by Nkanyani and Mudau [17].

Based on the findings from the two cases, it can be inferred that the developed scientific language register for Natural Sciences in isiNdebele positively influences classroom interactions and discourses. This, in turn, fosters meaningful learning in Natural Sciences and contributes to improved performance in the subject, as suggested by Scott et al. [13].

5. Conclusions

Based on the stakeholders’ responses, the question arises: does the developed scientific language register for Natural Sciences in isiNdebele shape classroom interactions and discourses? The stakeholders unanimously agreed that the register would positively influence these interactions and discourses. They emphasized that learners would benefit from learning Natural Sciences in their indigenous language, in which they are highly proficient and better able to understand. Consequently, this would reduce the language barrier and enhance their performance and engagement in the subject, allowing them to focus on the scientific concepts rather than the language itself. This viewpoint is supported by Motloung, Mavuru and McNaught [30], as well as political commentators like Dr. Somadoda Fikeni, traditionalists such as Zolani Mkiva, and historian and cultural analyst Professor Pitika Ntuli, all of whom assert that learning in an indigenous language should enhance learner performance.

Observations made when teachers used the isiNdebele register showed that learners interacted more actively and asked questions with ease. In contrast, when the English register was used, interactions were limited, with learners often being silent or simply agreeing with the teacher without questioning the content. From comparing the different classroom interactions and discourses observed with each register, one can infer that the developed scientific language register for Natural Sciences in isiNdebele does indeed positively influence classroom interactions and discourses. The findings of this study also suggest that using indigenous languages as the medium of instruction positively shapes classroom interactions and discourses, leading to meaningful learning and better performance. Therefore, it is recommended that scientific language registers in indigenous languages be developed and integrated into teaching and learning in South African schools. While the study involved two cases, its findings contribute to the discussion on the use of African indigenous languages and should be considered in further research.

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