



A minority language as language of instruction in the science classroom: A case study of a science teacher teaching at a German-speaking school in Namibia

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Abstract

Previous studies on the challenges teachers face when teaching science in German, as well as their corresponding coping strategies, feature a significant blind spot because—to our knowledge—they have only been conducted in regions, where German is the majority language. To address this blind spot, the present case study explores the perspectives of a science teacher on the role of German as language of instruction in a context in which German is a minority language. To this end, we conducted a narrative interview with a science teacher at a German-speaking school in Namibia and analyzed it qualitative-reconstructively. Our data analysis revealed that two meta-themes, which we labeled “teaching while navigating a monolingual norm” and “teaching while handling shortages,” pattern the key challenges and coping strategies of our interviewed teacher when she is teaching science in German language. The implications of this finding are outlined at the end of this paper.

Keywords: case study, German in Namibia, German as minority language, language of instruction, science education, teachers’ perspectives

INTRODUCTION

Within science education, irrespective of whether focusing on primary, secondary, or higher education, the language of instruction plays a crucial role, as it is both a prerequisite for learning and learning goal in itself (Cox-Petersen et al., 2012; Rosenthal, 1996; Wellington & Osborne, 2001). As a prerequisite for learning, the language of instruction serves communication and meaning making in the science classroom (Härtig & Höttecke, 2022). Working with science textbooks, teachers’ explanations of scientific concepts and phenomena, students’ experimenting in teams or groups, classroom discussions, etc., all rely on sufficient proficiency in the language of instruction by both students and teachers (Wellington & Osborne, 2001). On the other hand, developing proficiency in the language of instruction is a major learning goal in the science classroom (Härtig & Höttecke, 2022). The language use of natural sciences demands precision, accuracy, and clarity, and in science classes students are required to develop the ability to describe, explain, and communicate scientific concepts and phenomena using

scientific language (Krabbe et al., 2021). Therefore, besides acquiring content-specific knowledge and abilities within science education, students also need to learn—and need to have opportunities to learn—the specialized vocabulary, terminology, grammatical features, and conventions of scientific language within the language of instruction used in their science classes (Schleppegrell, 2004; Wellington & Osborne, 2001).

As well as students show diverse levels of content-specific knowledge and abilities regarding science, they also possess varying levels of proficiency in the language of instruction (Organization for Economic Cooperation and Development, 2019). Furthermore, results of large-scale assessments show that students’ knowledge and abilities in science substantially relates to their proficiency in the language of instruction (Härtig et al., 2015; Hackemann et al., 2022). Not surprisingly, studies have revealed that many students face difficulties, for example, to participate in discussions in the science classroom (Lee, 2005), to record results they obtained in experiments (Roll et al., 2020), or to demonstrate what they know and can do in classroom assessments (Luykx

Contribution to the literature

- Within the present case study, we explored the challenges that a science teacher at a German-speaking school in Namibia encounters in her science classroom related to German as the language of instruction and in what ways she copes with these challenges.
- Given its unique context, the present case study provides valuable insights about the role of German as language of instruction in science education in contexts, where German is a minority language.
- Through a qualitative-reconstructive analysis of a narrative interview that we conducted with the teacher, we identified two meta-themes (“teaching while navigating a monolingual norm” and “teaching while handling shortages”) that pattern key challenges and coping strategies of the teacher in her science classroom in which German is the language of instruction.

et al., 2007), when their proficiency level in the language of instruction is low or when they are taught in a language that is not their first language or strongest one. Consequently, the language of instruction is not only a prerequisite for learning and a learning goal within science education but also a potential learning barrier that can hinder students’ learning progression in the science classroom (Gieske et al., 2022; Schuck & Feser, 2022; Tolsdorf & Markic, 2016).

To make science education accessible to all of their students, irrespective of their students’ linguistic diversity, science teachers require proper professionalization. They must be aware that the language used in their science classes may present a barrier to their students, they require the ability to promote and support students’ scientific language usage, and they must be equipped with teaching strategies to overcome language-related barriers within their classrooms (Markic & Child, 2016; Pineker-Fischer, 2017; Tajmel, 2019). This kind of professionalization should be fostered within pre-service and in-service teacher-training programs (Mönch & Markic, 2022). However, in order to design suitable training programs for in-service and pre-service science teachers, science education research must provide clarity regarding the language-related challenges teachers face when teaching science, as well as their coping strategies in the face of these challenges. Beyond that, given that each language possesses unique linguistic features, a solely generic view of the languages of instruction is limited (Share, 2008). Instead, the different languages used as a language of instruction in science classrooms around the globe should be considered separately because the language-related challenges teachers face when teaching science and their coping strategies in the face of these challenges considerably depend on the distinctive linguistic features of the language of instruction they use (Amin, 2009; Qorro, 2013).

In the present study, we focus on German, which is the common language of instruction in science classes in Austria, Germany, Liechtenstein, and German-speaking parts of Switzerland (Ness & Lin, 2013). Over the past decade, there has been an increase in research on language-related teaching practices and the challenges

teachers face when teaching science in German language. There are mixed findings regarding the extent to which science teachers in German-speaking countries feel responsible for integrating the promotion of students’ subject-specific language proficiency, as a learning goal, into their science teaching. While the study by Riebling (2013) hints that science teachers tend to consider language learning an important goal of school science education, the study by Nitz et al. (2011) indicates the opposite. In line with that, Renner (2023), as well as Strunk and Höttecke (2023), observed a broad variety of beliefs and orientations on the part of pre-service teachers from Austria and Germany regarding the role of language in the science classroom (e.g., both authors’ groups found that some pre-service teachers consider the role of language in the science classroom solely as a transfer medium for subject content but that others consider it a major objective of their science teaching). Beyond that, previous research suggests that language-related teaching practices of science teachers in German-speaking countries are often limited to a reduction of the linguistic demands placed on students (Nitz et al. 2011; Riebling, 2013) and that science teachers tend to focus on students’ linguistic deficits while ignoring their linguistic resources (Feser & Höttecke, 2021; Tajmel, 2017). Additionally, although the number of multilingual students in German-speaking countries is high and steadily increasing (Ness & Lin, 2013), science teachers still seem to orient their teaching toward monolingual German-speaking students (Riebling, 2013; Schauer et al., 2023), instead of incorporating their students’ multilingualism into their lesson design (e.g., via trans-linguaging strategies; see also Duarte, 2019; Kroll & Höttecke, 2020). Generally, research suggests that science teachers in German-speaking countries rarely provide explicit language-related learning opportunities for their students and do not feel sufficiently qualified to do so (Becker-Mrotzek et al., 2012; Riebling, 2013).

Aim of Present Study

In summary, previous studies have already provided broad insights into the language-related challenges teachers face when teaching science in German

language, as well as their corresponding coping strategies. However, to the best of our knowledge, these previous studies have been conducted exclusively in regions, where German is the majority language, and its usage in school and everyday life is considered the norm (Boas & Wiese, 2023; Gogolin, 1997; 2021). Although German is predominantly spoken in Austria, Germany, Liechtenstein, and Switzerland, it is also a minority language in various other parts of the world¹ (Ammon, 2014). In neighboring countries, such as Belgium, Denmark, France, Italy, and Poland, large German-speaking communities exist. Furthermore, various German-speaking communities are also found in the United States, originating from historical waves of immigration. Analogously, this applies, for example, to Argentina, Brazil, and Namibia. Due to this fact, previous studies that have examined science teachers' challenges and coping strategies when teaching science in German language feature a significant blind spot. Because research on languages of instruction other than German has shown that the experiences and needs of students and teachers in minority-language contexts are very context specific and differ significantly from those in majority-language contexts (for corresponding literature reviews see, for example, Cenoz, 2009; Engle, 1975; Palova et al., 2023), it is, in our view, reasonable to assume that the results of previous studies on the coping strategies teachers use and the challenges teachers face when teaching science in German language may lack transferability to contexts in which German is a minority language.

The aim of the present research is to address this blind spot on the part of previous research on an exploratory level, as well as to shed light on science teachers' challenges and coping strategies when teaching science in German language in contexts in which German is a minority language. In doing so, we report the results of a case study that we conducted with a teacher we refer to as Ms. Alberer², who is a science teacher at a German-speaking school in Namibia. To preserve Ms. Alberer's anonymity, we deliberately kept some context details vague or omitted them from this paper. This case study is based on the following research question:

According to her perspective, what challenges does Ms. Alberer encounter in her science teaching related to the use of German as language of instruction, and in what ways does she cope with these challenges?

Below, we describe the context of our case study and our methodological approach. Following that, we report and discuss the results of our analysis.

Context of Study

German language in multilingual Namibia

Namibia is located in southwestern Africa, has a population of about 2.6 million people, and is a multilingual country with 27 living languages (Ethnologue, 2023). The sole official language of Namibia is English (Republic of Namibia, 2014)—although English is the first language of only 3.4% of its population (Namibia Statistics Agency, 2011). However, at the same time, the country has adopted an inclusive stance toward its citizens' linguistic diversity. Namibia's former Prime Minister and current President, Geingob (1995), puts this, as follows:

“In our country, where Afrikaans and German have the status of being the languages of a certain group of people or type, just as Oshiwambo, Otjiherero, Nama, Damara, Silozi, Mbukusha, Bucusu, or Rukwangali and many others are, these languages have no more right to become an official language than the language of any other group or type in Namibia [...] But for us, English is a neutral language and therefore can become the language of national unity. However, this is not to suggest that we wish to promote the English language to the exclusion of all other languages. On the contrary, we would like to see all languages promoted and enriched in their own right. We must therefore not think that English as official language and eventually as a lingua franca cannot coexist with other languages” (p. 177-179).

In particular, Namibia hosts a significant German-speaking community due to the arrival of German settlers during the late nineteenth and early twentieth centuries. These German settlers, who established themselves in Namibia when it was a German colony known as German South-West Africa, brought with them their language and culture (Kern, 2003; Zappen-Thomson, 2000). Today, German is the first language of about 1.0% of Namibia's population (Wiese et al., 2017; Zimmer et al., 2020), and German-speaking population is distributed mainly in the central areas of Namibia (Figure 1). Despite the fact that the number of first-language speakers is relatively small, German language is quite present in Namibia. Although there are no official statistics, it is assumed that a considerable proportion of the Namibian population is proficient in German as a second or third language (Ammon, 2014; Häusler, 2018). Moreover, German-speaking minority is an economically prosperous and influential group (e.g., in 2008, 27.6% of Namibia's total population lived below

¹ Issues regarding German as a language of instruction & related to German-speaking minorities were repeatedly instrumentalized for political purposes by far-right populists in Austria & Germany (Lobin, 2021; Riedel, 2015). We explicitly distance ourselves from any such instrumentalization.

² “Ms. Alberer” is a pseudonym that we randomly selected from surnames listed in the German telephone directory.

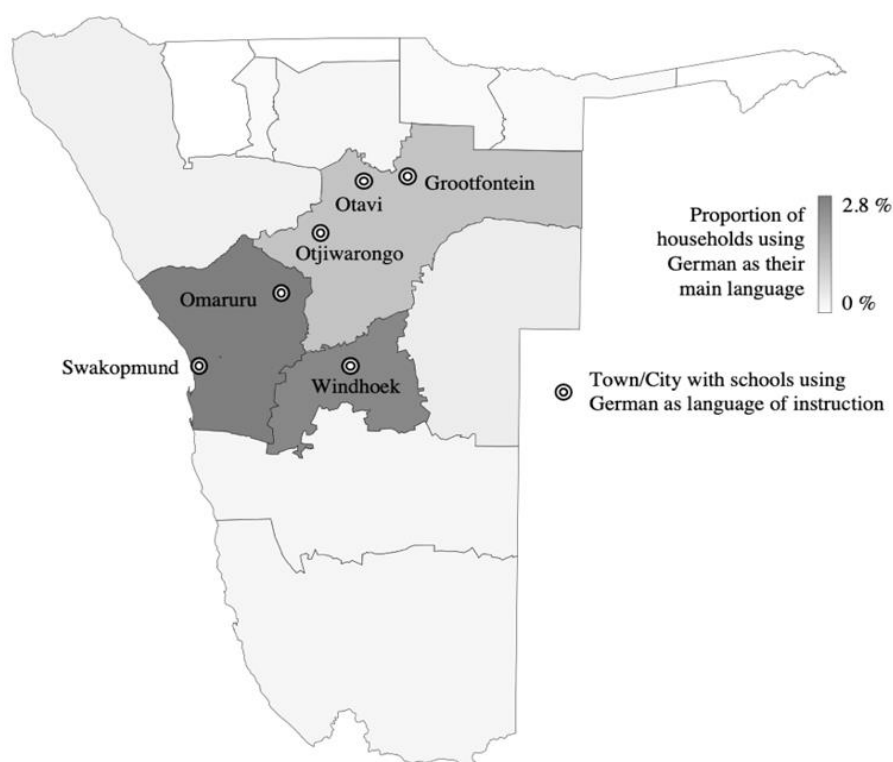


Figure 1. Distribution of German-speaking households & settlements with schools using German as language of instruction across Namibia (Namibia Statistics Agency, 2011; Zappen-Thomson, 2019)

the poverty line, while less than 1.0% of its German-speaking population did; see Republic of Namibia, 2008), which is why German language plays an important role in Namibia's economy and business life (Kellermeier-Rehbein, 2016).

Language education policy in Namibia & German language at Namibian schools

As Namibia is a multilingual country and has adopted English as its sole official language, the aim of its language education policy is, on one hand, to preserve the country's multilinguality and, therefore, promote students' proficiency in their first language and, on the other hand, to promote all students' English proficiency (Norro, 2022a). For this purpose, the Namibian curriculum defines English as a compulsory subject for all students, beginning at grade 1, and from grade 4 onward, English is the language of instruction in all school subjects (Ministry of Education, Arts, and Culture, 2016). Furthermore, in grade 1 to grade 3, the language of instruction is "the mother tongue/home language of the learner [...] if there are a sufficient number of learners for such a class" (Ministry of Education, Arts and Culture, 2016, p. 29), and from grade 4 onward, the students' first language continues to be taught as a subject (Ministry of Basic Education, Sport, and Culture, 2003). In this regard, current research indicates that Namibian teachers hold ambivalent beliefs about this language education policy: while many Namibian teachers believe that the transition to English,

as language of instruction, from grade 4 onward is problematic and would prefer it if students were taught in their first language for a longer time, they also believe that their students do not experience difficulties when they are taught in English (Norro, 2021, 2023).

During grade 1 to grade 3, the vast majority of Namibian students whose first language is German are taught in classes that use German as the language of instruction (Figure 2). From grade 4 onward, several thousand students—substantially more than there are students whose first language is German—attend German language classes; annually, several hundred students take their senior secondary school examination in German as a subject (Figure 2). Currently, German, as a subject, is taught in 53 schools in Namibia (Namibia Press Agency, 2019), and schools that use German as a language of instruction are located in six Namibian cities and towns (Figure 1). The majority of the schools that use German as language of instruction are private schools because private schools in Namibia are allowed to use German or any other language of Namibia as language of instruction, even after grade 3, and they are not bound by the requirement to have enough German-speaking students to form a class (Ministry of Basic Education, Sport, and Culture, 2003).

Ms. Alberer is a member of German-speaking minority in Namibia, and as a student, she herself attended a school in Namibia that used German as language of instruction. Today, she teaches at one of those German-speaking schools in Namibia.

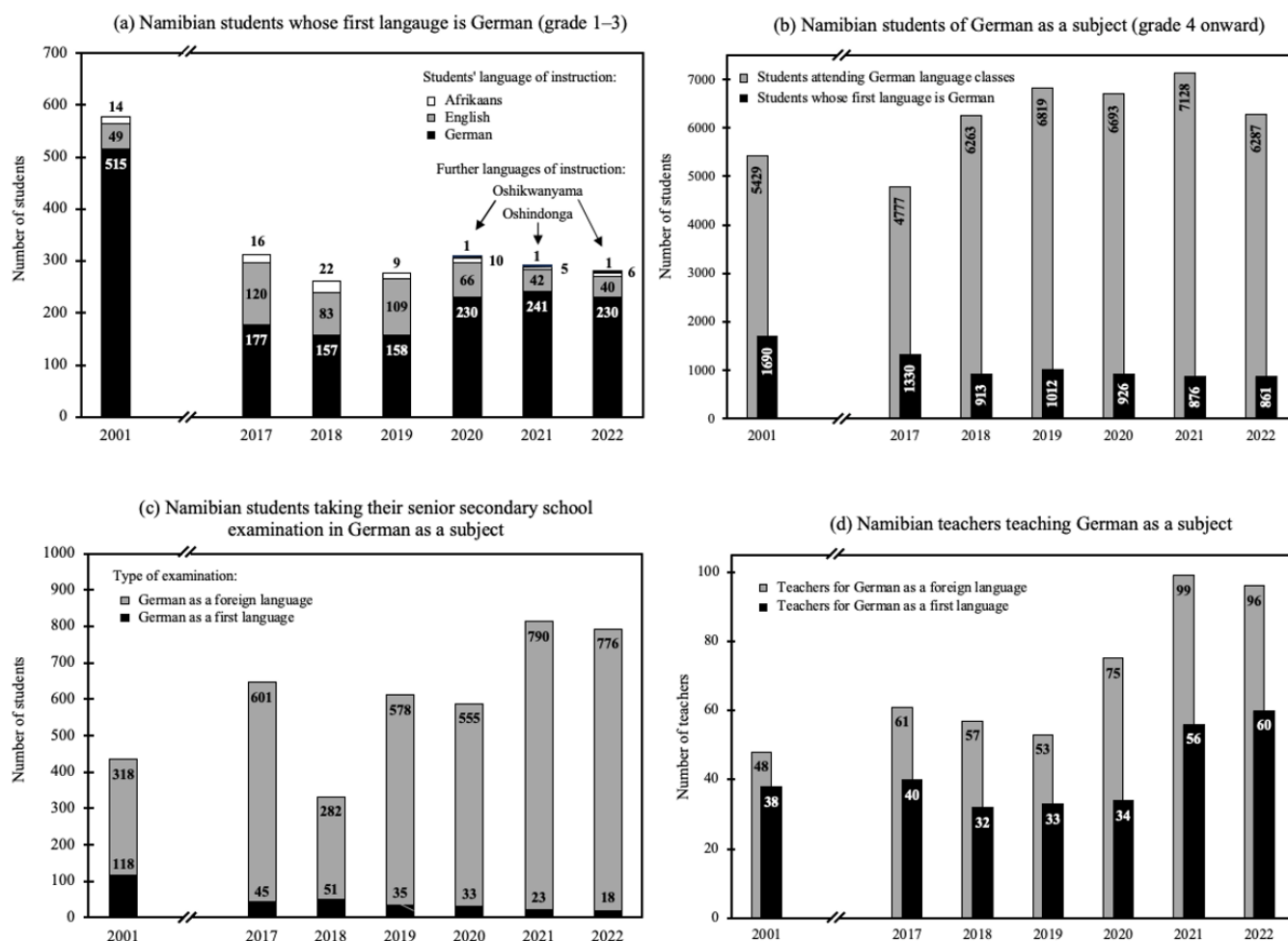


Figure 2. Selected educational statistics regarding the German language at Namibian schools (Ministry of Basic Education, Sport, and Culture 2002; Ministry of Education, Arts, and Culture, 2018, 2019, 2020, 2021, 2022, 2023)

At the school, where Ms. Alberer is currently teaching, most of the students are taught in multi-grade classes. In the lower grades, the language of instruction is German, and in the upper grades, all subjects, except German, are taught in English. In Ms. Alberer’s science classes, the language of instruction is German.

Data Collection & Analysis

The present study was conducted in accordance with the Austrian and German ethical standards for educational research (Watteler & Ebel, 2019). Ms. Alberer’s participation was voluntary and anonymous, and she was informed of the aim of the present study. For data collection, a one-hour narrative interview (Flick, 2009) was conducted with Ms. Alberer in February 2021. The entire interview was conducted in German and carried out via video telephony software. Inspired by the research of Strunk and Höttecke (2023), a series of narrative questions were posed to Ms. Alberer during the interview that encompassed her individual perspective on her professional biography, the school she teaches at, her science-teaching practices, and the role of German as a language of instruction in her science classes (**Appendix A**). Throughout the interview, these

questions were supplemented, as needed, with follow-up questions from the interviewer.

The interview with Ms. Alberer was qualitatively-reconstructively analyzed, borrowing from the methods for interpreting single-case interviews proposed by Heiner (2004) and Paseka (2010). More precisely, our data analysis involved the following steps:

1. The audio record of the interview was literally transcribed. Afterward, the transcript was segmented into semantic units (half-sentences to longer narratives) and numbered sequentially (Paseka, 2010).
2. The segmented transcript was then shortened and smoothed by deleting all words and passages that were not relevant for the interpretation (according to our research question). Thereby, the original wording was left unchanged as far as possible in order to preserve Ms. Alberer’s individual perspective for the further analysis process (Heiner, 2004). Subsequently, the shortened and smoothed transcript segments were generalized into grammatical short forms by paraphrasing and summarizing them, and transcript segments with the same grammatical short form were

grouped together (Heiner, 2004; Paseka, 2010). Following that, all grammatical short forms were compared regarding their content and strictly-inductively subsumed into thematic codes (Paseka, 2010), resulting in a summarized and content-ordered version of the transcript.

3. The thematic codes were then evaluated regarding their relevance to our research questions. In doing so, relevant thematic codes with broad similarities and strong interconnections were allocated into meta-themes that each pattern the key challenges and coping strategies of Ms. Alberer when teaching science in German language (Heiner, 2004). This allocation of thematic codes into meta-themes was based on Heiner's (2004) approach to conceptualizing individuals' professional practice, which can be summarized, as follows (see also de Menezes, 2012; Schneider et al. 2016): individuals act professionally in a specific way, on the basis of specific beliefs, considerations, or feelings, and strive to meet their professional goals within given contexts (that exhibit specific norms), which in turn results in (context-)specific outcomes.
4. Finally, by returning to the corresponding segments of the literally transcript, the way the identified meta-themes manifest themselves within in the interview with Ms. Alberer was interpreted in an in-depth manner and condensed into explicative texts that characterize and summarize the specifics of these meta-themes (Paseka, 2010).

To resolve uncertainties and discrepancies during the analysis and enhance the validity of our results, Steps 2 to 4 of the analysis were collaboratively and discursively conducted by both authors of this paper (Steinke, 1999). Additionally, we engaged in peer debriefings (Lincoln & Guba, 1985) with other educational researchers to discuss our interim results.

RESULTS

As result of our data analysis, we identified two meta-themes, which we labeled "teaching while navigating a monolingual norm" and "teaching while handling shortages." Each patterns the key challenges and coping strategies of Ms. Alberer when teaching science in German language.

In the following sections, we provide synoptic versions of the explicative texts for these two meta-themes that are supplemented by exemplary transcript excerpts³, which we grammatically corrected, partly reduced, and approximately translated into English (for German versions of these transcript excerpts see

Appendix B). In this regard, we caution that these exemplary transcript excerpts only serve plausibility and illustrative purposes and that empirical structures we describe in the following emerged from the qualitative-reconstructive analysis, as detailed above.

Teaching While Navigating A Monolingual Norm

Throughout our data analysis, we identified that navigating a monolingual norm is one of the meta-themes that pattern the key challenges and coping strategies of Ms. Alberer when teaching science in German language.

The language norms of Ms. Alberer's school are dominated by a monolingual norm; to be specific, that (almost) the entire school life is supposed to be organized and conducted in German language and that students' proficiency in German is self-evidently expected, rather than being considered a learning objective. Transcript excerpt 1 illustrates this. As Ms. Alberer states in this transcript excerpt, German is "very present" at her school. Other languages, especially English, seem to be of secondary importance. In order to be considered for admission to this school, applying students are required to be proficient in German. Furthermore, even in the upper grades, where the language of instruction is English, German, as a subject, is "of course" taught solely using German as the language of instruction⁴.

"I would say that German is still very present at our school [...] It is a prerequisite. You have to be proficient in German to attend our school [...] From grade █ to █, all lessons are taught in German, and in grades █ and █ in English, except for German, as a subject, of course" (transcript excerpt 1).

This monolingual norm at Ms. Alberer's school manifests itself in what issues she herself perceives as difficulties related to her everyday teaching practice. On the one hand, she describes the usage of English as language of instruction in upper grades, in contrast the usage of German as language of instruction in lower grades, as something that happens "suddenly" and is "weird" and that she and her students must "get used to" (see transcript excerpt 2). In particular, it emerges that she perceives English, as compared to German, as a counter-horizon, that is, as something that deviates from the dominant monolingual norm of her school and, therefore, causes difficulties.

"Suddenly, in grade █, everything has to be in English. That is [...] weird. But uhm you get used to that, and so do students" (transcript excerpt 2).

³ Within these transcript excerpts, █ represents text blackouts to preserve Ms. Alberer's anonymity.

⁴ For a critical perspective on this monolingual approach within language teaching, see, for example, Butzkamm (2011).

On the other hand, she also classifies her students' as challenging or non-challenging based on their proficiency in German. For example, in transcript excerpt 3, she distinguishes between students' who speak German "not very often" and are sometimes "very difficult to support" and students who speak German "in a very well-groomed way." Also, she considers language-related teaching practices that aim to support students' who struggle with German as language of instruction (e.g., repetition using other words) to be "a step backward." In doing so, she indicates that she perceives the language of instruction used in her science classroom primarily as the transfer medium for subject content (the steps forward her students should take), rather than a major goal of her science teaching.

"The students' proficiency in German is extremely different [...] There are students who come from [...] a context, where they speak German not very often. And then you have students who speak German [...] in a very well-groomed way [...] And, sometimes, you need to take a step backward. Then, I try [...] to explain things again using other words [or] [...] I ask one of the other students to do so [...] Sometimes, it is very difficult to support the students who are not so good in German" (transcript excerpt 3).

Beyond that, the monolingual norm of Ms. Alberer's school is also reflected in the fact that, during the interview, she does not frame the multilingualism of her students as something that potentially enriches her science lessons if it is incorporated into her lesson design (e.g., via translanguaging strategies such as allowing Afrikaans speaking students to use Afrikaans instead of German when they explain something to other Afrikaans speaking classmates; see also Duarte, 2019; Norro, 2022b, 2022c). Instead, as illustrated in transcript excerpt 4, Ms. Alberer's coping strategies often seem to be aimed at preserving and perpetuating the monolingual norm of her school. When students use languages other than German in her science classes, she "definitely encourage[s] the students to properly speak German" and "tr[ies] to keep things in German." Furthermore, she also views her students' multilingualism as something that "from time to time [...] makes teaching really difficult." In this regard, she particularly highlights students who speak "Namlisch" or Otjiherero ("Herero") in her science classes. The term "Namlisch" refers to a variety of the English or German language that is spoken in Namibia and has strongly been influenced by the vocabulary and grammatical features of other Namibian languages, especially Afrikaans (Zimmer et al., 2020). Because of this influence, Namlisch features forms of language usage that are considered incorrect in standard English/German (Otaala & Plattner, 2013; Wiese et al., 2014). Unfortunately, the interview transcript does not provide clear information about whether Ms. Alberer is

using the term "Namlisch" to refer to a variety of English or German. Nevertheless, according to her perspective, students who use Namlisch during instruction "speak gobbledygook" and do not "speak proper German." In other words, their language use contradicts the language norms of her school, which is why these students "definitely" require encouragement to comply with these norms. Analogously, this applies to how she positions Otjiherero. In transcript excerpt 4, she frames the usage of Otjiherero by students within the classroom as something that is not commonplace ("[it] happened a few times"), as something that does not belong there ("[it's] great when they do that in the schoolyard"), and as something that requires adjustment to the language norms of the school ("[w]e definitely try to speak German here").

"The thing is, here in Namibia, kids grow up multilingual. They grow up with English and Afrikaans and Namlisch and German. And, from time to time, that makes teaching really difficult. [...] Occasionally, some students switch over to English a little bit. Or they speak Namlisch, i.e., they speak gobbledygook. In such cases, we definitely encourage the students to properly speak German. And what also happened a few times is that some students who are also proficient in Herero speak Herero. I think that is great when they do that in the schoolyard, especially when, for example, students from German contexts have learned Herero and want to practice it. But in my science classes, I definitely try to keep things in German. We definitely try to speak German here" (transcript excerpt 4).

Notwithstanding this, Ms. Alberer does not endorse the monolingual norm of her school without reflecting it to some extent. In transcript excerpt 5, this becomes evident. In this transcript excerpt, she initially describes an experience in her science classes and how German, as language of instruction, hinders the task handling of one of her students (the student "constantly confused terms or used them incorrectly"). Subsequently, she contrasts this experience with an observation from her mathematics classes in which the same student "now [...] can handle tasks very well." However, she ascribes this difference in task handling not to differences between science and mathematics as school subjects but, rather, to the fact that the language of instruction in her science classes is German and, in her mathematics classes, the language of instruction is English. She concludes "that the way we use German at our school is not always a good idea." Additionally, later in the interview, she admits that, during instruction—if she sees no other suitable options ("[o]ccasionally, you have to")—she herself deviates from the monolingual norm of her school by switching between English and German. This coping strategy illustrates that Ms. Alberer seems to

consider the monolingual norm of her school as something negotiable if conditions require her to do so, especially because “students speak various [...] other languages at home.”

“For example, I asked students to explain how a shadow is formed. [...] And I had one student who constantly confused terms or used them incorrectly [...] What is interesting is that this student always confused terms, even though she’s actually German. But this year, I teach her mathematics and only in English. And now, with English as the language of instruction, she can handle tasks very well, especially context-related tasks. Initially, I expected her to struggle after what I’ve experienced in science class. But this shows that the way we use German at our school is not always a good idea [...] The fact that students speak various [...] other languages at home plays a big role [...] Occasionally, you have to repeat things in English and in German” (transcript excerpt 5).

Teaching While Handling Shortages

In addition to navigating a monolingual norm, our data analysis also revealed that handling several aspects of shortage is a second meta-theme that patterns Ms. Alberer’s professional practice as a science teacher at a German-speaking school in Namibia. These aspects of shortage were evident throughout the entire interview and centered on a lack of science textbooks and a shortage of students and teachers⁵. Furthermore, there are no simple solutions to overcome these shortages (see below), which is why they create a need for coping strategies in Ms. Alberer’s everyday teaching practice.

Lack of science textbooks in Namibia written in German

The first aspect of the shortage that was evident in the interview with Ms. Alberer relates to the lack of Namibian science textbooks written in German. As Ms. Alberer highlights in transcript excerpt 6, the fact that her school follows the Namibian curriculum creates a problem in that she and her students are limited to the use of Namibian textbooks and these textbooks are not available in German⁶. As she describes, she herself perceived this circumstance as something “really horrible” when she began to work at her school, which also suggests that she views textbooks as essential guides for her science teaching—something that is

common among Namibian teachers (Lubben et al., 2003; United Nations Children’s Fund, 2011)—and indicates her preference for well-structured lesson designs. Furthermore, straightforward solutions to this problem utilized by other German-speaking schools in Namibia, namely the use of textbooks from Germany, are not practical for her, because textbooks that are suitable for her science classes must be written in German but also cover the content defined in the Namibian curriculum (e.g., “the Namibian ecosystem”). Instead, her coping strategy to overcome the lack of suitable textbooks for her science classes is to create “self-made textbooks” that are based on German translations and revisions of existing Namibian textbooks written in English.

“Because we follow the Namibian curriculum, we only have textbooks in English. My former colleague started to [...] translate these English textbooks, and I reworked them [...] And now, we have self-made textbooks that are translated from Namibian ones. But, here and there, I added, changed, or omitted some things [...] The [redacted]-School [another German-speaking school in Namibia] [...] got its textbooks from Germany, and [...] their curriculum is rather Germany-based. But we [...] cover the Namibian ecosystem and things like that; our curriculum is very focused on Namibia. [...] Well, it was really horrible for me when I knew I was going to teach at this school, and I would not have proper textbooks” (transcript excerpt 6).

As indicated above, from Ms. Alberer’s perspective, textbooks are suitable for her science classes if they are written in German and reflect the Namibian curriculum. Beyond that, as indicated in transcript excerpt 7, suitable textbooks must also meet specific layout characteristics from her point of view, which further highlights her preference for well-structured lesson designs. For example, from her perspective, proper textbooks must have “page numbers.” Additionally, she describes that loose-leaf binders create “chaos” during instruction because students may disorganize them. Therefore, “binders with loose papers in them” seem to be misaligned with the specific layout characteristics Ms. Alberer is pursuing (i.e., the fixed-order structure of a bound textbook).

“The students just had [...] binders with loose papers in them. It was chaos because the students dropped these binders, and then, they popped

⁵ Additionally, aspects of shortage related to the COVID-19 pandemic were evident in the interview with Ms. Alberer. For example, she states that currently she lacks time for experiments in science classes due to pandemic regulations, or that many of her students have “missed quite a lot” due to school closures. However, since these aspects of shortage appeared to be extraordinary compared to Ms. Alberer’s regular teaching practice, we discounted them from our in-depth analysis.

⁶ Additionally, there is a chronic shortage of textbooks in Namibia in general (e.g., United Nations Educational, Scientific and Cultural Organization, 2016; World Bank Group, 2015), which presumably further complicates Ms. Alberer’s situation.

open. And then, pages were missing or were filed incorrectly. That was an awful situation my first year here [...] Therefore, I decided I have to come up with a decent plan so that the students have proper textbooks that [also] include page numbers [...] And yes, that is why I revised them" (transcript excerpt 7).

Deviation from any of these three requirements (German language, curricular conformity, and specific layout characteristics) seems to conflict with Ms. Alberer's idea of a "proper textbook" because it evokes feelings of unease for her, which she labels as "really horrible" (transcript excerpt 6) and "awful" (transcript excerpt 7). Conclusively, her unease regarding the lack of Namibian science textbooks written in German seems to be a key challenge for Ms. Alberer when teaching science in German language. However, she copes with this challenge in a non-resigned manner. In fact, these feelings of unease appear to underlie constructive and deliberate actions on the part of Ms. Alberer to address the lack of science textbook written in German ("I decided I have to come up with a decent plan so that the students have proper textbooks"). In other words, feelings of unease represent more than a key challenge for Ms. Alberer when teaching science. These feelings also drive her to adopt a teaching practice that aims to adjust the conditions within her science classroom in such a way that these conditions become aligned with her preference for well-structured lesson designs.

Shortage of students & teachers

The second aspect of shortage that emerged from the interview with Ms. Alberer is a shortage of students and teachers. As she describes in Transcript Excerpt 8, due to changes in Namibian society ("[m]any young German Namibians go to Germany [...], [and] German language is losing status in Namibia"; see also Kellermeier-Rehbein, 2016; Zappen-Thomson, 2019), German-speaking schools in Namibia, including her school, face increasingly difficulty in attracting new students⁷. Furthermore, she indicates that this shortage of students is accompanied by a shortage of teachers, which is a general problem many teachers and stakeholders in Namibian education report (Norro, 2021; Republic of Namibia 2022; see also Figure 2). In transcript excerpt 8, Ms. Alberer specifies this shortage of teachers⁸ by mentioning that, in Namibia, there is a particular shortage of "teachers for Germans as a subject," as well as a shortage "of German-speaking teachers."

"We have several German-speaking schools in Namibia, but it is quite difficult to attract new students [...] Numbers are just getting smaller and smaller. When I started teaching, our school had

over [redacted] students, [and] [...] this number is decreasing [...] Many young German Namibians go to Germany because there are simply more opportunities. And, on the other hand, [...] German language is losing status in Namibia [...] [At German-speaking schools in Namibia] we not only have a shortage of students but, currently, also a shortage of teachers. Particularly, teachers of German, as a subject, are a bit difficult to find here in Namibia [...] And in Namibia, the shortage of German-speaking teachers is also very widespread" (transcript excerpt 8).

The shortage of students and teachers drives a need to handle this problem at Ms. Alberer's school. As transcript excerpt 9 details, these shortages are initially addressed at her school's administrative level. Due to the shortage of students and teachers, her school must "combine classes [...] to multi-grade classes," and available teachers, including Ms. Alberer, are required to teach "a wide range of school subjects."

"We have to combine some of our classes into multi-grade classes [...] Thus, single-grade instruction is becoming increasingly scarce, which is not really an optimal development, especially when you have a very motley class, where differentiation is really needed among the students ... But then, you have two different classes combined [...] Well, uhm, that keeps you on your toes [...] And in our school, teachers need to cover a wide range of school subjects. For example, I also teach [redacted] [longer listing of school subjects], and that sometimes makes it difficult to devote a lot of thought to my lesson planning [...] Personally, I would prefer not to teach German as a subject but, rather, focus on natural sciences [...] But teachers of German are [...] particularly rare" (transcript excerpt 9).

However, as transcript excerpt 9 further indicates, this administrative coping with a shortage of students and teachers has a substantial influence on Ms. Alberer's everyday teaching practice and, therefore, represents a key challenge for her. First, this applies to the shortage of teachers, which causes each teacher at Ms. Alberer's school to teach a multitude of subjects. She complains that the large number of subjects she is required to teach keeps her from "devoting a lot of thought in [her] lesson planning" and that she wished she could solely focus on her science classes. By stating that she "would prefer not to teach German as a subject[,] [...] but [that] teachers of German are [...] particularly rare[.]" she indicates that she perceives the conditions that result in her teaching German as a subject as something that is beyond the

⁷ For a quantitative illustration of this increasing difficulty (Figure 2).

⁸ However, number of Namibian teachers who teach German as a subject has considerably increased in recent years (Figure 2).

school's influence but also as a serious challenge for her school, which she has some responsibility to handle. Beyond that, she perceives the fact that, at her school, grade-by-grade instruction is becoming less and less frequent as "not really an optimal development." She elaborates on this by referring to the fact that, according to her perspective, heterogeneous classes ("very motely class[es]") require differentiation during instruction and teaching multi-grade classes poses additional challenges to this end. In this regard, in contrast to the lack of science textbooks (see above), Ms. Alberer does not express feelings of unease but, rather, refers to these challenges as something "that keeps you on your toes." A potential explanation for this difference in attribution is that, while the lack of science textbooks drives her to adjust the conditions within her science classroom (to create "self-made textbooks"; transcript excerpt 6), the conditions that result in multi-grade classes at her school are outside her sphere of action and, therefore, cannot be adjusted by her. Instead, she needs to adopt an adaptive behavior, which requires her to constantly adapt her teaching practice to the needs of her "multi-grade" and "very motley" students, which constantly presents new challenges for her.

DISCUSSION & CONCLUSIONS

Within the present case study, we aimed to explore the challenges Ms. Alberer—a science teacher at a German-speaking school in Namibia—encounters in her science teaching related to German as the language of instruction, as well as how she copes with these challenges. To this end, we conducted a narrative interview with Ms. Alberer and analyzed it qualitatively-reconstructively.

Through this data analysis, we identified the monolingual norm at Ms. Alberer's school, according to which German is the dominant language for organizing and conducting school life, as one meta-theme that patterns the challenges she faces when teaching science in German. Furthermore, her corresponding coping strategies show a tension between preserving and perpetuating this monolingual norm and acknowledging her students' multilingualism, highlighting the complexity of the way in which she navigates the language norms of her school. Additionally, the findings that Ms. Alberer does not frame her students' multilingualism as something that potentially enriches her science lessons are very consistent with the findings from research conducted in Germany, which revealed that many science teachers orient their teaching toward monolingual German-speaking students (Riebling, 2013). Thus, this finding may also be considered as providing support for Gogolin's suspicion (1997) that, although "[a] 'monolingual habitus' is [...] an essential constitutive element of German state school system[, it may] [...] also

be relevant to multilingual nation states [...] and their school systems" (p. 41). However, this support for Gogolin's (1997) suspicion is restricted to the context of Ms. Alberer's school. The extent to which this support may be transferable to other German-speaking schools in Namibia cannot be determined based on the present case study. Therefore, future research should be conducted in order provide evidence in this regard. Moreover, assuming that the results of the presents case study are generalizable to the Namibian context, it may also be particularly fruitful for future research to investigate how to design teacher-education programs that aim to support science teachers at German-speaking schools in Namibia in further incorporating their students' multilingualism into their lesson designs. The starting point for such research efforts might be the adaptation of existing teacher-training programs and materials that focus on how to address students' multilingualism in the science classroom (e.g., Stangen et al., 2020; Rutt & Mumba, 2022).

Our data analysis further revealed that several aspects of shortage also represent key challenges facing Ms. Alberer when teaching science in German language. On one hand, a lack of Namibian science textbooks written in German poses a significant challenge for Ms. Alberer because her school follows the Namibian curriculum and textbooks are, from her perspective, essential guides for her science teaching and accommodate her preference for well-structured lesson designs (see also Lubben et al., 2003; United Nations Children's Fund, 2011). On the other hand, German-speaking schools in Namibia, including Ms. Alberer's school, face difficulties in attracting new students and suffer from a shortage of teachers, which forces her school to combine classes into multi-grade classes, and teachers must teach a wide range of subjects. These aspects of shortage drive Ms. Alberer to adopt corresponding coping strategies and, therefore, significantly impact her everyday teaching practice. The shortage of suitable science textbooks requires her to put in extra effort to create German-translated textbooks for her students, while the shortage of teachers and the multi-grade class situation require her to constantly adapt her teaching practices to meet the diverse needs of her students. Furthermore, given that these aspects of shortage are not specific to Ms. Alberer's school but, rather, general issues within the Namibian education system (Kellermeier-Rehbein, 2016; Norro, 2021; Republic of Namibia 2022; United Nations Educational, Scientific and Cultural Organization, 2016; World Bank Group, 2015; Zappen-Thomson, 2019), Ms. Alberer's corresponding challenges and coping strategies yield potential scopes for educational policy in Namibia. Specifically, they highlight the need to take proactive steps to address the lack of science textbooks written in German, recruit and retain teachers qualified to teach science in German and to teach German as a subject and

assist teachers teaching in multi-grade class settings. Addressing issues can potentially enhance the quality of teaching at German-speaking schools in Namibia and accommodate their students' unique needs.

In conclusion, given its unique context, the present case study provides valuable insights into the role of German, as language of instruction, in science education in contexts in which German is a minority language and, thus, complements existing research on the challenges teachers face when teaching science in German, as well as their corresponding coping strategies, which to our knowledge, has only been conducted in regions, where German is the majority language. Beyond that, the results of the present study hold significant relevance for the international audience, transcending the specific context of Ms. Alberer's German-speaking school in Namibia. The challenges she faces in teaching science in German, amidst a monolingual norm and the complexities of her students' multilingualism, reflect broader issues observed in diverse educational settings (e.g., Barros et al., 2021; Iiping & Banda, 2020; Kinyaduka & Kiwara, 2013; Knudsen et al., 2021; Lengyuel & Salem; 2023). Most notably, the alignment of her experiences with the findings from research conducted in Germany (Gogolin, 1997; Riebling, 2013) indicates a potential commonality in the challenges science teachers encounter when navigating language norms. This, in turn, suggests that our study's insights may resonate not only in Namibia but also in other countries with similar educational systems, which—in our view—is something that should be further explored in future research.

Notwithstanding, it is important to acknowledge several limitations inherent in the present study. First, the findings and insights obtained from Ms. Alberer's experiences may not be generalizable to other science teachers facing similar challenges in other German-speaking-minority contexts. The unique circumstances of Namibia's German-speaking schools may limit the transferability of the results to other regions with distinct linguistic and cultural backgrounds. Furthermore, conducting a narrative interview may have limited the breadth of the data collected. Thus, our data analysis may have missed important challenges and coping strategies on the part of Ms. Alberer related to German as a language of instruction in her science classroom, which could have been captured via other data-collection methods, such as classroom observation. Consequently, a broader sample of science teachers from different contexts, as well as using different methods of data collection and analysis in future research, would be beneficial in providing a more comprehensive and robust understanding of the complexities of teaching science using German as language of instruction in German-speaking-minority contexts. To this end, the present case study offers valuable insights that can serve as a foundation for such further research.

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APPENDIX A: QUESTIONS POSED DURING THE NARRATIVE INTERVIEW (APPROXIMATE TRANSLATION)

1. At the beginning of the interview, I would like to get to know you a little better. Therefore, can you tell me a bit more about yourself?
2. Can you tell me how you became a teacher?
3. Can you tell me how you came to teach at [REDACTED] [name of Ms. Alberer's school]?
4. How would you characterize [REDACTED] [name of Ms. Alberer's school]? What, in your opinion, makes your school special?
5. How would you describe a typical lesson in your science class?
6. Do you or your students also use textbooks in science classes? If so, which ones do you use and to what purposes?
7. Please tell me about "the best" science lesson you ever taught. What was special about this lesson in your opinion?
8. In your opinion, in what ways are science classes at your school different from science classes at other schools in Namibia?
9. Can you tell me about a specific situation that occurred in your science classroom and where language or language education was particularly important?
10. Generally speaking, what role does German language play in your science classroom? What role do other languages play?
11. Is there anything else that we have not talked about that you would like to address?

APPENDIX B: GERMAN VERSION OF TRANSCRIPT EXCERPTS OF THE RESULTS SECTION (GRAMMATICALLY CORRECTED & PARTLY REDUCED)

Transcript Excerpt 1

Deutsch ist hier [Frau Alberers Schule] noch sehr präsent sage ich mal [...] Also es ist halt Voraussetzung, man muss Deutsch können, und dann kann man halt zu uns auf die Schule [...] Bei uns ist von Klasse █ bis █ im Unterricht alles auf Deutsch und in Klasse █ und █ auf Englisch, außer Deutsch als Unterrichtsfach natürlich

[I would say that German is still very present at our school [...] It is a prerequisite. You have to be proficient in German to attend our school [...] From grade █ to █, all lessons are taught in German, and in grades █ and █ in English, except for German, as a subject, of course].

Transcript Excerpt 2

Dann plötzlich in der █ Klasse, dann muss alles in Englisch sein. Das ist [...] komisch [...] Aber ähm man gewöhnt sich dran und die Kinder auch

[Suddenly, in grade █, everything has to be in English. That is [...] weird. But uhm you get used to that, and so do students].

Transcript Excerpt 3

Die Sprachkenntnisse von den Kindern sind unheimlich unterschiedlich [...] Da sind Kinder, die kommen aus [...] einem Kontext, wo die nicht groß Deutsch sprechen. Und dann hast du Kinder, die [...] sehr gepflegtes Deutsches sprechen. [...] Manchmal muss man dann einen Schritt zurückgehen [...] Dann versuche ich [...] das nochmal auch mit anderen Worten [oder] [...] ich lasse ein anderes Kind das nochmal erklären [...] Es ist halt teilweise auch sehr schwierig, die Kinder aufzufangen, die jetzt nicht ganz so gut in Deutsch sind

[The students' proficiency in German is extremely different [...] There are students who come from [...] a context, where they speak German not very often. And then you have students who speak German [...] in a very well-groomed way [...] And, sometimes, you need to take a step backward. Then, I try [...] to explain things again using other words [or] [...] I ask one of the other students to do so [...] Sometimes, it is very difficult to support the students who are not so good in German].

Transcript Excerpt 4

Das Ding ist, hier in Namibia werden die Kinder ja mehrsprachig groß. Das ist wirklich, dass die mit Englisch und Afrikaans und Namlisch und Deutsch aufwachsen. Und daher ist das Unterrichten auch wirklich manchmal schwierig [...] Teilweise ist es halt so, dass die Kinder so ein bisschen Englisch reinsprechen. Oder dieses Namlisch, dass die dann so ein Kauderwelsch sprechen. Aber da versuchen wir dann die Kinder auf jeden Fall zu animiert, richtig Deutsch zu sprechen. Und was jetzt auch schon ein paar Mal passiert ist, dass halt auch so ein paar Kinder, die halt auch Herero können, dass die dann auch Herero sprechen. Was ich auch schön finde, wenn die das auf dem Pausenhof tun, auch wenn zum Beispiel Kinder aus deutschen Kontexten Herero gelernt haben, das auch üben wollen. Aber im Naturwissenschaftsunterricht bin ich dann eher auf jeden Fall Deutsch. Wir versuchen jetzt auf jeden Fall Deutsch zu sprechen

[The thing is, here in Namibia, kids grow up multilingual. They grow up with English and Afrikaans and Namlisch and German. And, from time to time, that makes teaching really difficult. [...] Occasionally, some students switch over to English a little bit. Or they speak Namlisch, i.e., they speak gobbledygook. In such cases, we definitely encourage the students to properly speak German. And what also happened a few times is that some students who are also proficient in Herero speak Herero. I think that is great when they do that in the schoolyard, especially when, for example, students from German contexts have learned Herero and want to practice it. But in my science classes, I definitely try to keep things in German. We definitely try to speak German here].

Transcript Excerpt 5

Ich hatte zum Beispiel als Aufgabe, die Kinder müssen erklären, wie sich ein Schatten bildet [...] Und da hatte ich eine Schülerin, die immer Begriffe verwechselt und falsch benutzt hat [...] Interessant ist, dass diese Schülerin halt immer Sachen sehr verdreht hat, obwohl sie eigentlich Deutsch ist. Aber jetzt [dieses Schuljahr]

habe ich sie in Mathematik und nur noch in Englisch. Und mit Englisch als Unterrichtssprache kann sie jetzt vor allem für Sachaufgaben so gut bearbeiten. Am Anfang dachte ich, das wird ein bisschen hapern, nachdem was ich im Naturwissenschaftsunterricht gesehen habe. Aber da sieht man, dass dieses Deutsch hier auch nicht immer ganz so gut ist [...] Dass Kinder verschiedene [...] andere Sprachen zu Hause sprechen, das spielt schon eine große Rolle [...] Dann [im Sinne von "Es kommt vor"] muss man das in Englisch nochmal sagen und in Deutsch

[For example, I asked students the explain how a shadow is formed. [...] And I had one student who constantly confused terms or used them incorrectly [...] What is interesting is that this student always confused terms, even though she's actually German. But this year, I teach her mathematics and only in English. And now, with English as the language of instruction, she can handle tasks very well, especially context-related tasks. Initially, I expected her to struggle after what I've experienced in science class. But this shows that the way we use German at our school is not always a good idea [...] The fact that students speak various [...] other languages at home plays a big role [...] Occasionally, you have to repeat things in English and in German].

Transcript Excerpt 6

Weil wir dem namibischen Lehrplan folgen, haben wir halt nur englischen Schulbücher. Und meine Vorgängerin hatte angefangen diese Bücher [...] zu übersetzen und ich habe das dann nochmal überarbeitet [...] Und jetzt haben wir halt so selbstgemachte Bücher, die von namibischen Büchern übersetzt sind. Aber hier und da habe ich einiges hinzugefügt, oder verändert, oder weggenommen [...] Die ██████-Schule [Name einer anderen Schule in Namibia] [...] hat ihre Bücher aus Deutschland und [...] die haben eher deutschlandbasierten Unterricht. Aber wir [...] behandeln halt hauptsächlich Namibias Ökosysteme oder sowas; das [unser Curriculum] ist halt sehr auf Namibia basiert [...] Also ich fand das ganz furchtbar, als ich wusste, ich fange jetzt hier an [Frau Alberers Schule] und habe keine anständigen Bücher

[Because we follow the Namibian curriculum, we only have textbooks in English. My former colleague started to [...] translate these English textbooks, and I reworked them [...] And now, we have self-made textbooks that are translated from Namibian ones. But, here and there, I added, changed, or omitted some things [...] The ██████-School [another German-speaking school in Namibia] [...] got its textbooks from Germany, and [...] their curriculum is rather Germany-based. But we [...] cover the Namibian ecosystem and things like that; our curriculum is very focused on Namibia. [...] Well, it was really horrible for me when I knew I was going to teach at this school, and I would not have proper textbooks].

Transcript Excerpt 7

Die [Schüler*innen] hatten [...] einfach so einen Schnellhefter mit Papieren drinnen. Und das war ein Chaos, weil die Kinder haben die fallen lassen und dann sind die aufgegangen. Und dann haben Seiten gefehlt oder waren falsch eingehftet. Das war furchtbar in meinem ersten Jahr [...] Da habe ich beschlossen ich muss einen anständigen Plan machen, damit die richtige [Schüler*innen] Bücher haben, die [auch] Seitenzahlen haben [...] Und ja, deswegen habe ich die dann überarbeitet

[The students just had [...] binders with loose papers in them. It was chaos because the students dropped these binders, and then, they popped open. And then, pages were missing or were filed incorrectly. That was an awful situation my first year here [...] Therefore, I decided I have to come up with a decent plan so that the students have proper textbooks that [also] include page numbers [...] And yes, that is why I revised them].

Transcript Excerpt 8

Wir haben hier [in Namibia] ja mehrere deutsche Schulen, aber da ist halt immer mit dem Nachwuchs so problematisch [...] Es wird halt immer weniger. Als ich angefangen habe, da hatte unsere Schule über ██████ Kinder [und] [...] das wird halt weniger [...] Viele junge Deutsche [Deutschnamibier] gehen halt nach Deutschland, weil da die Möglichkeiten einfach viel größer sind. Und zum anderen, [...] verliert Deutsch in Namibia an Stellenwert [...] [An deutschsprachigen Schulen in Namibia] haben wir nicht nur einen Schüler-, sondern momentan auch einen Lehrermangel. Gerade Deutschlehrer sind hier in Namibia ein bisschen schwierig zu finden [...] Und in Namibia ist dieser deutschsprachige Lehrermangel halt auch sehr weit verbreitet

[We have several German-speaking schools in Namibia, but it is quite difficult to attract new students [...] Numbers are just getting smaller and smaller. When I started teaching, our school had over ██████ students, [and] [...] this number is decreasing [...] Many young German Namibians go to Germany because there are simply more opportunities. And, on the other hand, [...] German language is losing status in Namibia [...] [At German-speaking schools in Namibia] we not only have a shortage of students but, currently, also a shortage of teachers. Particularly, teachers of German, as a subject, are a bit difficult to find here in Namibia [...] And in Namibia, the shortage of German-speaking teachers is also very widespread].

Transcript Excerpt 9

Teilweise müssen wir die Klassen kombinieren [...] Und der Klassen-Einzelunterricht wird halt immer weniger, was halt eigentlich nicht so eine optimale Entwicklung ist [...] Gerade wenn man so eine kunterbunte Klasse hat, wo man eigentlich schon differenzieren müsste innerhalb der Klasse... Und dann hat man noch zwei verschiedene Klasse [kombiniert] [...] Also, ähm man bleibt auf trapp [...] Und bei uns [Frau Alberers Schule] ist die Lehre sehr vielfältig. Also ich unterrichte zum Beispiel auch noch ██████████ [längere Aufzählung weiterer Schulfächer], [...] was es natürlich teilweise schwierig macht, sich jedes Mal groß Gedanken zu machen [...] Ich zum Beispiel möchte auch gar kein Deutsch als Fach unterrichten, sondern lieber meine Naturwissenschaften [...] Aber insbesondere Deutschlehrer sind halt [...] eine Rarität

[We have to combine some of our classes into multi-grade classes [...] Thus, single-grade instruction is becoming increasingly scarce, which is not really an optimal development, especially when you have a very motley class, where differentiation is really needed among the students ... But then, you have two different classes combined [...] Well, uhm, that keeps you on your toes [...] And in our school, teachers need to cover a wide range of school subjects. For example, I also teach ██████████ [longer listing of school subjects], and that sometimes makes it difficult to devote a lot of thought to my lesson planning [...] Personally, I would prefer not to teach German as a subject but, rather, focus on natural sciences [...] But teachers of German are [...] particularly rare].

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