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Research Article

Exploring Student Perspectives and Practices with Language-Aware Materials in Geography Education: An Exploratory Case Study in a German High School Classroom

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Abstract: Developing language-aware teaching materials is increasingly recognized as essential for enhancing both language proficiency and content acquisition in diverse classroom settings. However, understanding which materials students find most beneficial for effectively preparing for A Level exams remains a crucial inquiry. This study addresses this gap through a mixed-methods approach that integrates the creation of language-aware teaching materials, preand post-test surveys, and ethnographic observations conducted in two German high school geography classrooms. Students were provided with a range of language-aware materials and empowered to select those they deemed useful for composing localizations within the geography curriculum. The findings reveal that students predominantly utilized checklists, while showing the least engagement with definitions. Moreover, students identified checklists, formulation support, and model texts as particularly helpful for writing localizations in geography, contrasting with perceptions of definitions as less beneficial. Additionally, the study identifies four distinct student typologies characterized by varied approaches and motivations in utilizing language-aware materials. In summary, this research provides insights into developing more inclusive materials tailored to heterogeneous classrooms, offering effective strategies to enhance both language development and content learning in geography education.

Keywords: geography education; language awareness; scaffolding; teaching materials

Highlights:

- Students preferred using checklists, formulation support, and model texts over definitions.
- Identification of four student types, differing in their motivation and approaches.
- Students requested more feedback on written tasks.

1. Introduction

In today's globalized and migratory society, linguistic diversity is commonplace, necessitating a nuanced approach to education, particularly concerning language among younger generations. Language serves not only as a medium of expression but also as a tool for active participation in societal discourse, making it indispensable for fostering informed and engaged individuals. This significance extends beyond traditional language disciplines to encompass content-driven subjects like geography, where effective communication hinges on linguistic proficiency and awareness (Michalak et al., 2015).

Within German schools, characterized by a diverse student body in terms of language backgrounds, there has been a notable rise in critical inquiries (Morawski, 2019, Education Report 2022). Schwarze (2017) introduces scaffolding as an adaptable and flexible approach suitable for heterogeneous student groups. However, the efficacy and reception of such interventions among students remain pivotal questions. This research embarks on an explorative case study to address two fundamental inquiries:

- 1. What are students' attitudes, preferences and practices regarding the use of language-aware materials in geography classrooms?
- 2. What are students' specific needs when tackling written assignments in geography?

These questions emerge from the increasing linguistic diversity observed in German classrooms, necessitating language-aware teaching strategies that cater to diverse academic preferences and requirements (Education Report 2022). After reviewing various language-awareness approaches, this paper examines the current landscape of research in geography education concerning language-awareness. Grounded in this theoretical framework, the study presents and critically analyzes findings from its case study.

The terms "attitudes" and "preferences" must be conceptually differentiated. Attitudes pertain to individuals' feelings, beliefs, and predispositions towards objects, people, or situations, whereas preferences denote a comparative evaluation, indicating a choice or selection among alternatives (Ajzen, 2001; Fishbein & Ajzen, 1975). This distinction is crucial for theoretical framing and empirical analysis, ensuring clarity and precision in the discourse. Therefore, it is imperative to maintain distinct meanings and implications of these terms throughout the manuscript. Additionally, the concept of "practices" in the context of students must be academically defined. Practices encompass the habitual actions and behaviors that students engage in within educational settings. These include study habits, classroom participation, and other routine activities



that contribute to their learning processes and academic development. Understanding and analyzing these practices is vital for identifying effective educational strategies and improving overall student performance Recognizing the imperative role of language-aware teaching materials in enhancing both language skills and content acquisition across diverse educational settings, this study addresses the essential inquiry of which materials students find most beneficial in preparing for A Level exams. Employing a mixed-methods approach, including the development of language-aware teaching materials, pre- and post-test surveys, and ethnographic observations conducted in two German high school geography classrooms, the research empowers students to select from a range of language-aware materials.

In conclusion, this research offers valuable insights into the development of inclusive materials tailored to heterogeneous classroom environments. It provides effective strategies to enhance both language development and content learning in geography education, thus contributing to broader discussions on optimizing educational practices amidst linguistic diversity.

2. Theoretical Background

2.1. Understanding Language Awareness

This chapter aims to elucidate the concept of language awareness through three distinct approaches pertinent to this study's objectives. The metalinguistic approach centers on learners' ability to analyze and reflect on language structures independently of content (Ramirez et al., 2013). Activities such as morphological analysis exemplify this approach, fostering deeper insights into language patterns and structures (Berry, 2005). By cultivating metacognitive skills, this approach enables learners to self-correct and enhance their language proficiency through explicit grammar instruction and application in sentence construction and vocabulary use.

In contrast, the sociocultural approach views language as inseparable from its cultural and social contexts (Hawkins, 2010). Learners engage in authentic settings, participating in discussions and realistic role plays to understand language in use and its cultural implications. This approach promotes a holistic language awareness that transcends grammar and vocabulary, emphasizing language as a tool for constructing social identity and fostering intercultural exchange. In the context of geography instruction, the sociocultural approach explores how linguistic support facilitates authentic interactions, enhancing students' communicative competence and intercultural awareness within dynamic social settings. The science literacy approach integrates linguistic awareness with scientific inquiry and discourse (Merzyn, 1998; Drumm, 2016). It emphasizes the acquisition of scientific terminology and discourse practices essential for understanding and communicating scientific concepts effectively (OECD, 2015). By immersing learners in scientific experiments and debates, this approach facilitates the acquisition of both content knowledge and language skills, particularly valuable in multilingual classrooms.

In conclusion, these approaches to language awareness underscore diverse perspectives on language learning and application, each contributing uniquely to students' linguistic and cultural competencies in educational contexts.

2.2. Language Awareness in Geography Teaching

2.2.1. Multilingualism in German Schools

Linguistic diversity in schools, particularly in Germany, has become the norm (Fürstenau & Gomolla, 2011). In recent years, and notably since 2017, there has been a significant decrease in the number of children growing up monolingual; by 2021, only 61.6% of students reported speaking solely German at home. This represents a 12% decrease since 2016 and a 22% decrease since 2011. Consequently, multilingualism has emerged as a crucial social and cultural phenomenon in German schools (IQB Bildungstrend 2021; Tracy, 2014).

An important consideration in this context is that "everyday language competencies do not necessarily coincide with educational language competencies" (Schwarze, 2017), meaning "these competencies cannot be inferred from one another" (Tajmel & Hägi-Mead, 2017). In addressing internal multilingualism, which includes dialects, national standard variations, and colloquial language within the educational framework, it must be noted that students proficient in their native languages may still lack academic language skills (Tajmel & Hägi-Mead, 2017).

What then distinguishes language proficiency for academic purposes from everyday language proficiency? Cummins (1979) introduced the terms "basic interpersonal communicative skills" (BICS) and "cognitive academic language proficiency" (CALP) to describe this distinction. BICS represent conversational language abilities used in everyday contexts, characterized by context-specific language and fixed word combinations, which are typically insufficient for effective classroom learning (Cummins, 1979; Feilke, 2012). In contrast, CALP is a discourse competency that is precise, objective, systematic, and independent of context. It is conceptually used in textual contexts and forms the foundation for instructional teaching and learning (Cummins, 1979).

To understand complex concepts and information, academic language integrates common language, school language, and content-specific language (Leisen, 2019). Since subject learning and language learning are inseparably linked, language development in content subjects progresses from everyday language to instructional language, and finally to academic language (Leisen, 2019). The goal of instruction is to develop academic language, rather than treating it as a prerequisite for learning. Therefore, examining and experimenting with the linguistic component of learning is crucial to support students in acquiring academic language (Feilke, 2012).

This objective aligns with broadly accepted educational principles, such as the concept of "continuous language education" (Gogolin & Lange, 2011), which aims to sustain language support through cross-curricular and cross-grade collaboration. Ahrenholz (2009, as cited in Lehnen, 2012) highlights the didactic value of teaching grammar, including text-building routines and patterns. Current studies further suggest that focusing on the language skills and linguistic potential of multilingual students can help reduce linguistic disparities (Gogolin, 2021).

In conclusion, language instruction should be viewed as a fundamental component of subject teaching, as language proficiency is essential for comprehending and conveying content knowledge (Repplinger & Budke, 2018).

2.2.2. Language as a Tool—The Role of Language in Geography Teaching

This chapter explores the role of language competency as an element for academic learning, as shown in international studies such as the "Program for International Student Assessment" (PISA), the "Trends in International Mathematics and Science Study" (TIMSS), and the "International Reading Literacy Study" (IGLU). Specifically, PISA, TIMSS, and IGLU should be referred to as large-scale assessments throughout the paper.



Language plays a significant role in geography education, serving as a tool for instruction, conversation, and exchange (Mereckaité, 2022). According to Michalak et al. (2015), language is both a communication tool and a means of performance evaluation. Budke and Weiss (2014) emphasize that, when teaching geography with a language-aware approach, "the subject-specific language requirements for understanding and answering geographical questions in instruction, based on the students' prerequisites, should be considered" (p. 127). Budke and Kuckuck (2017) identify five transdisciplinary discourses to determine the language needs in geography instruction. They provide suitable support strategies and explanations for the topics "Integration through Language Support," "Bilingual Geography Education," "Communication Competence," "Linguistic Turn," and "Inclusion through Language Support," which are discussed below.

The concept of "Integration through Language Support" alludes to Germany's role as a destination for immigrants. The goal is to enable students with a migrant background to achieve academic integration and linguistic support within the context of geography education. Heterogeneity and multilingualism are viewed as opportunities for academic learning, particularly in geography instruction, which not only fosters geographic knowledge but also supports students' learning about their own identities and linguistic awareness (Weißenburg, 2013). Thus, creating didactic concepts and methods to support a linguistically diverse group of students in terms of general language skills, academic language skills, and subject-specific language skills is essential to geography education (Budke & Kuckuck, 2017).

According to the German Society of Geography (Deutsche Gesellschaft für Geographie [DGfG], 2020), bilingual education involves "subject-specific instruction in non-language subjects [...] primarily using a foreign language for academic discourse." Several studies (Budke & Kuckuck, 2017; Serwene, 2017; Morawski, 2019) have investigated ways to foster language proficiency in geography education, but further discussion is required on the applicability of didactic methods used in bilingual geography education to non-bilingual geography teaching.

One of the six competency areas in geography education is communication skills, defined as the "ability to understand, objectify, and present geographical facts and to engage in appropriate discussions about them with others" (DGFG, 2020). The third discourse, "Communication Competence," aims to enhance students' communication skills and provide opportunities to apply theoretical knowledge in practice (Budke & Kuckuck, 2017). Research on geography education has highlighted the value of argumentation as a problem-solving tool and as a crucial component of successful learning (Budke et al., 2015; Uhlenwinkel, 2015; Budke & Kuckuck, 2017).

The "increased significance of constructivist approaches in social sciences and human geography" (Budke & Kuckuck, 2017) reinforces the "Linguistic Turn," which posits that language constructs reality and social identity. The final discourse, "Inclusion through Language Support," addresses language assistance for all students, particularly those with language disabilities. In subject-specific education, as formally established under the UN Convention on the Rights of Persons with Disabilities, social engagement of all students is essential.

In conclusion, the opportunity for a multi-perspective geography education supported by various forms of multilingualism should be recognized, and geography instruction should be modeled on this concept.

2.2.3. Theoretical Foundations of Language-aware Geography Teaching

The term "language-aware instruction" encompasses various pedagogical strategies deliberately employing language as a communicative tool, aimed at integrating language acquisition with subject-specific knowledge (Woerfel & Giesau, 2018). In the context of geography instruction, providing language support necessitates an approach that avoids oversimplification of linguistic demands. Rather, the emphasis should be on constructing pathways and resources enabling students with limited proficiency in content language to engage meaningfully with more complex inquiries (Morawski et al., 2017). The foundation of language-aware instruction can be traced back to the British concept of language awareness initially proposed by linguist Hawkins, and subsequently expanded upon by James and Garret. This evolution culminated in Tajmel's (2017) conception of teachers' critical-reflexive language awareness within the context of subject-specific instruction. Addressing issues of educational inequality, prejudice, and barriers to educational access requires a critical examination of hegemonic factors, where language serves as a decisive element in both inclusion and exclusion (Tajmel & Hägi-Mead, 2017). In the realm of subject education, the concept of critical-reflexive language awareness encourages educators to implement nondiscriminatory, critical, and reflective teaching methodologies (Tajmel, 2017). Ultimately, language-aware instruction should be regarded not as an adjunctive approach but as an integral component of subject-specific instruction.

2.2.4. Practical Implications of Language-aware Geography Teaching

The Language-aware teaching in geography education involves intentionally integrating language development with the learning of geographical concepts and skills. This approach recognizes the dual challenge faced by students, especially those in multilingual or ESL settings, who must grasp complex geographical content while also developing the academic language proficiency necessary to articulate their understanding effectively (Budke & Kuckuck, 2017; Morawski & Budke, 2017; Morawski, 2019; Schwarze, 2017).

Educators adopting language-aware teaching utilize scaffolding as a key method to support students in bridging the gap between their current language abilities and the learning goals. Scaffolding involves providing structured assistance such as sentence starters, visual aids, glossaries, and model texts, gradually reducing support as students gain proficiency. This approach ensures that students are not overwhelmed by the demands of both content and language learning, thereby enhancing the effectiveness of educational practices (Leisen, 2019).

Scaffolding, as a pedagogical strategy, has been extensively explored and documented in international research, underscoring its significance in facilitating student learning and development. To strengthen this discussion, it is recommended to incorporate seminal works such as those by Gibbons (2002), who provides a detailed examination of scaffolding in second language education, highlighting its role in supporting language learners through structured interaction and the gradual removal of support as competence increases. Additionally, referencing Wood, Bruner, and Ross (1976) is crucial, as their foundational work introduces the concept of scaffolding within the context of cognitive development, emphasizing the importance of guided assistance in problem-solving tasks. Furthermore, studies by Van de Pol, Volman, and Beishuizen (2010) offer a comprehensive review of scaffolding in education, presenting various scaffolding strategies and their effectiveness in diverse learning environments. Incorporating these references will not only enhance the depth of the discussion but also align it with established international literature, thereby providing a robust theoretical and empirical foundation for the concept of scaffolding. By integrating these sources, the manuscript will present a well-rounded exploration of scaffolding, illustrating its application across different educational contexts and reinforcing its critical role in supporting student learning and development.

An essential component of language-aware teaching in geography is the deliberate use of teaching strategies that promote both geographical literacy and language proficiency. For instance, teachers introduce specific vocabulary related to geographical phenomena and ensure students



can use this vocabulary accurately in context. They design activities that require higher order thinking skills, encouraging students to articulate their reasoning using appropriate academic language (Schwarze, 2017).

Key elements of language-aware teaching materials in geography include:

- 1. Visual Descriptors: Diagrams, maps, and annotated images that connect visual information with key vocabulary.
- 2. **Comparative Language**: Exercises that prompt students to compare and contrast different geographical features, practicing comparative structures in language.
- 3. **Directional Terminology**: Tasks that involve describing locations and movements using directional terms, enhancing spatial awareness and communication skills.
- 4. Scale Awareness: Activities that help students understand and describe geographical scales, from local to global contexts.
- 5. **Model Texts**: Examples of well-structured written pieces that demonstrate clear organization and expression of ideas in geography-related assignments.
- 6. **Checklists and Phrasing Support**: Tools to guide students in structuring their writing, ensuring inclusion of necessary elements and use of appropriate academic language (Steingrübl & Budke, 2022).

In summary, language-aware teaching in geography is crucial for facilitating students' comprehension and expression of complex geographical concepts. By addressing language barriers and promoting equitable educational opportunities, educators can create inclusive learning environments where all students can thrive, regardless of their linguistic background (Budke & Kuckuck, 2017; Morawski & Budke, 2017; Morawski, 2019; Schwarze, 2017; Leisen, 2019). This approach not only enhances educational equity but also challenges institutional discrimination by ensuring fair access to educational resources and opportunities for all students.

3. Materials and Methods

3.1. Methodical Choice

This study employed a mixed-methods approach that combines pre-test and post-test surveys with ethnographic observation. The goal with this methodological choice was to gain a comprehensive understanding of students' attitudes towards language-aware materials in the geography classroom (Table 1). The assignment of writing a complete localization was chosen as the subject for this study.

Table 1. Methods to answer the research question

Research Question	Method
- What are students' preferences and practices when engaging with language-aware materials in the geography classroom?	- Pre- and post-test surveys, ethnographic observation, creation of dif- ferent language-aware materials
- What are students' needs when working on written assignments in the subject of geography?	- Pre- and post-test surveys

Before delving into methodological considerations, it is pertinent to justify the written assignment of localizations within the context of upper-level geography education in German high schools. Localizations play a pivotal role as they involve the detailed portrayal of specific regions, emphasizing their physical attributes, coordinates, and often their socioeconomic characteristics. These assignments serve as a means to assess students' proficiency in geographic knowledge and their ability to effectively communicate this understanding. In Germany, localizations constitute a component of geography exams, typically aligning with Cognitive Demand Level 1, which assesses basic comprehension of subject matter and descriptive capabilities without necessitating high-level analysis or critical thinking (Bildungsstandards, 2020). The versatility of localizations allows for their integration into various lesson topics, thereby making them a suitable focus for this study.

In educational research, pre- and post-tests are indispensable tools for collecting data to measure changes within a specific sample before and after a designated intervention. Maintaining consistency in measurement instruments and testing conditions is crucial to ensure the reliability and validity of research findings (Döring & Bortz, 2016). This study employed pre- and post-tests to evaluate students' attitudes towards language support in geography education and their preferences for using language-aware materials.

The pre-test encompassed four questions designed to assess students' familiarity with writing localizations, their self-assessment of the quality of their written assignments, as well as their perceived challenges and preferences regarding written assignments in geography (see Appendix A1). Additionally, a Likert scale question was included to gauge students' attitudes towards language-aware teaching materials in geography and their confidence in their ability to write texts in this subject area. The Likert scale, a commonly used psychometric tool, provided structured insights into students' perceptions (Stier, 1999). Open-ended questions were also incorporated into the pre-test, particularly to capture nuanced responses regarding students' definitions of effective localizations and their specific difficulties and aspirations for future lessons. Open-ended formats were chosen to allow for diverse and genuine student responses, minimizing the likelihood of guessing and enabling a more accurate assessment of student knowledge and perspectives (Krosnick & Presser, 2010; Porst, 2011).

Conversely, the post-test consisted of twenty-one questions, four per learning aid, with the final question being open-ended to capture general feedback on learning support (see Appendix A2). Closed-ended questions in the post-test provided quantitative data for objective analysis, while open-ended questions allowed students to elaborate on their experiences and perceptions, enriching qualitative insights into their interactions with language-aware materials.

Additionally, ethnographic observation was employed to provide a deeper understanding of student behaviors and interactions with language-aware materials during geography lessons. This methodological approach facilitated contextual insights that complemented survey findings, offering a comprehensive perspective on students' engagement with educational interventions.



In conclusion, this study adopted a mixed-methods approach to comprehensively investigate students' attitudes towards language-aware materials in geography education. Surveys provided structured data on prevalent preferences and behaviors, while ethnographic observation offered contextualized insights into specific classroom dynamics and student interactions with educational resources. By triangulating findings from different methodologies, this research achieved a nuanced understanding of how language-aware materials are utilized in geography education, contributing valuable insights to educational practices and pedagogical strategies.

3.2. Materials

To explore students' perspectives and practices with language-aware materials in geography education, a diverse array of resources was developed specifically for this study. These materials encompassed a variety of language-aware tools, allowing students the flexibility to choose options that best suited their needs. During the post-test phase, students were invited to articulate reasons for their choices regarding the utilization or non-utilization of specific language-aware materials, thereby shedding light on their preferences in approaching written assignments within the geography classroom. In order to discern the linguistic requirements of the task involving the composition of a comprehensive localization for Chololo, Tanzania, the lesson was systematically deconstructed into its linguistic actions and structures using the planning framework developed by Tajmel and Hägi-Mead (see Appendix A3). This assignment posed both linguistic and structural demands, necessitating the provision of supportive materials for both language formulation and structural organization to assist students in successfully completing the written task. The materials were designed with a balanced approach incorporating both input and output scaffolds, following insights from Zydatiss (2010). Five distinct materials were developed for this purpose (see Appendix A4):

- 1. **Formulation Support:** This input scaffold included a glossary featuring terms extracted from students' textbook pages relevant to their localization task, providing concise definitions for each term to aid comprehension.
- 2. **Checklist:** Serving as the first output scaffold, this resource focused on the structural components essential to a localization, offering students a tool for structuring and self-assessing their work during and after the writing process.
- 3. **Table:** The third resource integrated both structural and linguistic support through guided questions, facilitating students' ability to formulate responses effectively—an output scaffold approach.
- 4. **Formulation Suggestions:** This resource omitted guiding questions present in the third material, solely offering formulation prompts to guide students' writing process.
- 5. **Model Text:** Utilizing genre-based teaching strategies, this material provided a structured example of a localization for a comparable region, emphasizing linguistic features and employing color-coding to highlight key components. Formulation supports aligned with the model text were also included—an output scaffold.

The collective design of these language-aware materials aimed to assist students in fulfilling the requirements of the localization assignment by addressing both linguistic and structural dimensions effectively.

3.3. Sample Description

The study sample comprised two 11th-grade (Q1) geography classes totaling 40 students at a Gymnasium in North Rhine-Westphalia, Germany. This type of school prepares students for higher education and culminates in the award of the Abitur high school diploma in 2025. One class was designated as a Grundkurs (standard-level course), while the other was classified as a Leistungskurs (advanced-level course). The sample represented a diverse student body, including German-born bilingual students and Ukrainian refugees.

3.4. Data Analysis Methodology

To ensure the robustness and reliability of data analysis, interrater reliability was rigorously assessed by four independent raters using Cohen's Kappa coefficient. The high level of agreement among the raters (κ = 0.73888) indicated consistent categorization of qualitative responses, thereby enhancing the validity of the study's findings. The methodological approach adopted a combination of deductive and inductive strategies for categorizing and analyzing data, following the framework outlined by Mayring (2015). Deductive categorization utilized established theoretical frameworks, while inductive approaches facilitated the integration of emergent themes from the data. Qualitative content analysis was employed to evaluate survey responses, focusing on substantive aspects to gain a comprehensive understanding of students' perceptions and experiences. Ethnographic observations complemented the survey data, providing contextual depth and enriching the interpretation of results. Figure 1 depicts the iterative process of data collection, analysis, and refinement, illustrating the systematic approach employed to ensure rigor and reliability in the research outcomes.

4. Results

4.1. Descriptive Findings

After analyzing the results of the pre-test, it is evident that students generally demonstrated a reasonable level of confidence when tasked with writing localizations in the geography classroom. As depicted in Figure 2, a majority of students rated their confidence level at four on the Likert scale, indicating a high degree of assurance in their ability to complete such assignments effectively. Students showed familiarity with the essential components of a localization (refer to Appendix A5: Category 1). However, challenges were noted, particularly regarding methodological knowledge, especially in providing coordinates. Furthermore, students expressed concerns about their limited practice in writing localizations, which contributed to their diminished confidence in this aspect (refer to Appendix A5: Category 2).

After evaluating the pre-test responses, it is clear that students highlighted several critical elements essential for effective localizations in geography. According to the findings illustrated in Figure 2, students emphasized the inclusion of coordinates, neighboring countries, the continent where the region is situated, and the climate zone (refer to Appendix A5: G1.K1). Additionally, they articulated that the primary purpose of writing localizations is to provide an orientation of a specified area (refer to Appendix A5: G1.K2). In response to the third question, students identified



challenges primarily in finding appropriate formulations (refer to Appendix A5: G3.K2), utilizing suitable maps from the atlas (refer to Appendix A5: G3.K1), and accurately providing coordinates (refer to Appendix A5: G3.K3).

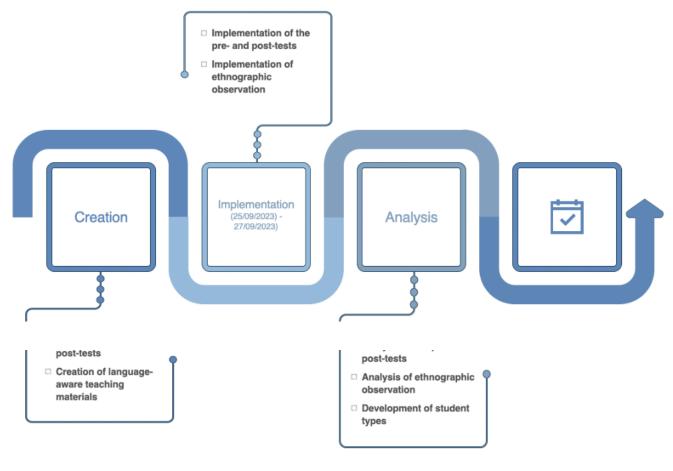


Figure 1. Conducting the research: Step-by-step

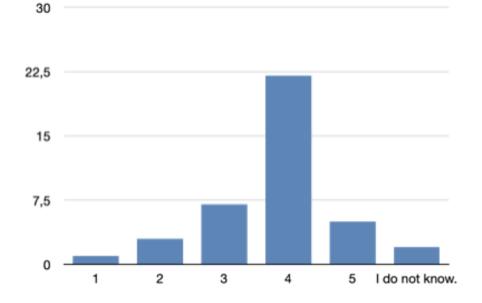


Figure 2. Students' level of confidence for writing a localization



Overall, students expressed a desire for more supportive materials, including precise maps (refer to Appendix A5: G4.K2) or page references within the atlas (refer to Appendix A5: G4.K5), formulation aids (refer to Appendix A5: G4.K1), and exemplar texts, such as model localizations (refer to Appendix A5: G4.K3). Moreover, they emphasized the need for increased practice opportunities to enhance their proficiency in writing localizations and other texts in geography classes (refer to Appendix A5: G4.K4).

Figures 3 and 4 depict the distribution of student engagement with various language-aware materials and their perceptions of their utility. Of the 33 students who interacted with the first resource, a glossary of definitions, only six utilized it, while 27 did not. Among all students, 15 perceived this material as beneficial, whereas 18 did not. Students appreciated definitions, particularly when encountering unfamiliar terms (refer to Appendix A6: G1.K1), noting that these aids saved time (refer to Appendix A6: G1.K2), enhanced their ability to express themselves more clearly and accurately (refer to Appendix A6: G1.K3), and simplified their writing process (refer to Appendix A6: G1.K4). Conversely, many students did not find definitions helpful because they were already familiar with the terminology (refer to Appendix A6: G2.K1) and found reviewing all definitions time-consuming (refer to Appendix A6: G2.K2).

Regarding the checklist, 24 out of 33 students found it useful for structuring their localizations, while nine did not engage with it. The checklist was praised for providing organizational guidance (refer to Appendix A6: G3.K1) and structural support (refer to Appendix A6: G3.K2), enabling self-assessment post-writing (refer to Appendix A6: G4.K4). Conversely, some students opted out of using the checklist due to their familiarity with localization structures (refer to Appendix A6: G4.K1).

Fifteen students utilized the table, combining formulation and structural aids, while 18 did not. Among users, 24 found it beneficial for formulating content (refer to Appendix A6: G5.K2) and simplifying the writing process (refer to Appendix A6: G5.K3), particularly with the aid of guiding questions (refer to Appendix A6: G5.K5). However, other students preferred alternative resources (refer to Appendix A6: G6.K1) and felt overwhelmed by the variety of phrases available (refer to Appendix A6: G6.K3).

Sixteen students engaged with phrasing support, while 17 did not. Of those who used it, 27 found it helpful for saving time (refer to Appendix A6: G7.K2) and enhancing clarity in expression (refer to Appendix A6: G7.K4). Some students preferred the table format for formulation support over standalone phrasing aids (refer to Appendix A6: G8.K1).

Regarding model texts, 16 students accessed them, whereas 16 did not. Of the users, 26 found model texts advantageous for structuring their localizations (refer to Appendix A6: G9.K1), simplifying their writing process (refer to Appendix A6: G9.K2), and self-assessment (refer to Appendix A6: G9.K3). However, some students viewed model texts as time-consuming resources (refer to Appendix A6: G10.K1) better suited for independent study outside of class (refer to Appendix A6: G10.K2).

Ethnographic observations revealed varying engagement times, with students spending between one- and five-minutes reviewing materials before commencing assignments. Some quickly identified helpful resources, while others, particularly non-German native speakers, took more time to select suitable aids.

In summary, while the checklist received the highest engagement, definitions were the least utilized (refer to Figure 3). The checklist, formulation support, and model texts were most valued for supporting localization writing (refer to Figure 4). Students expressed clear preferences for additional formulation aids (refer to Appendix A6: G11.K1), model texts (refer to Appendix A6: G11.K3), and increased practice opportunities in geography lessons (refer to Appendix A6: G11.K2).

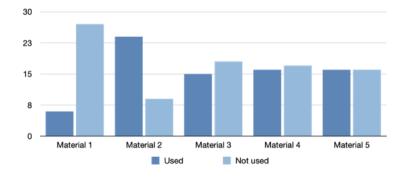


Figure 3. Use of language-aware materials

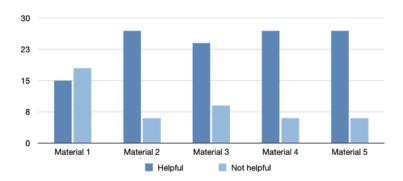


Figure 4. Perceived utility of the language-aware materials



4.2. Interpretive Findings

Based on their engagement and approach towards language-aware materials, students in this study can be categorized into four distinct types, reflecting their attitudes and practices (see Fig. 5).

The first category identified is the "Overestimator," characterized by students who believe they possess sufficient knowledge and skills to complete tasks independently, such as writing localizations in geography. For instance, one student confidently stated, "I know the criteria needed for a localization and can formulate them into text" (Appendix A5: Student LB76). Despite this confidence, these students often overlook essential elements like coordinates and neighboring countries in their actual assignments. They tend to avoid using additional language-aware materials, perceiving them as unnecessary aids (Appendix A6: Student KM1, TC92). This tendency to overestimate their abilities leads them to miss out on potentially beneficial supports.

The The Motivated **The Selective** The Requestor **Overestimator** These students seek These students are These studnets are very These students believe additional information motivated to try new selective when it comes they already have and support by resources and are to using additional sufficient knowledge requesting model texts, materials. They make generally more open to and skills, mostly definitions, and using differnt aids. They deliberate choices overestimating their formulation aids. are willing to about specific materials. abilities. They may not However, they may not experiment with especially those that are use the materials much fully use these materials different approaches already familiar to because they think that due to their perception and materials to them. They only utlize they already know of them as too long. enhance their skills. what they find relevant everything they need. They may have a and helpful, avoiding preferance for shorter excessive effort. resources.

Figure 5. Types of students using language-aware materials

Conversely, the "Requestor" actively seeks out supplementary information and materials. These students express a desire for more background information, definitions, and detailed instructions (Appendix A6: Student HZ16). However, they may struggle to fully utilize the provided supports due to their perceived lengthiness or preference for more concise resources (Appendix A6: Student HZ16, J41). Despite requesting materials like model texts, they might not effectively integrate them into their learning process during classroom activities.

The third type, termed the "Motivated," demonstrates a proactive approach towards learning by actively engaging with various materials to enhance their knowledge and skills. These students are willing to experiment with different supports, such as phrasing aids and model texts, and demonstrate consistent efforts to improve (Appendix A5: Student RK15).

Lastly, the "Selective" students are discerning in their use of additional materials, opting for resources they find directly applicable or already familiar with. They make deliberate choices based on relevance and efficiency, preferring not to invest effort in materials they perceive as redundant (Appendix A6: Student N55, SH91).

The distribution of these student types within the sample is illustrated in Figure 6, with the "Motivated" being the most prevalent, followed by the "Selective," "Requestor," and "Overestimator."

In conclusion, these categorizations provide insights into how students engage with language-aware materials, highlighting varying levels of self-assessment, motivation, and strategic selection in their learning approaches.

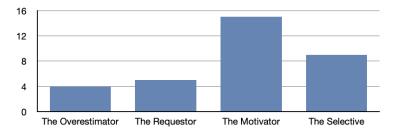


Figure 6. Distribution of the different types of students

5. Discussion

In the realm of education, understanding students' attitudes and behaviors towards language-aware materials in geography classrooms warrants comprehensive investigation. This section discusses the significance of this study, which offers valuable insights into students' perspectives and practices concerning these materials, drawing on observations from related studies that explore disciplinary literacy approaches.



5.1. Students' Views and Practices

This study reveals a generally positive reception of language-aware materials among students, who actively request and utilize them in their text writing endeavors. This trend extends beyond geography classrooms; foreign language educators also leverage such materials to support their students (Abdelaziz Ahmed, 2018; Khan & Ullah, 2021). However, variations exist among students in their engagement with these resources, highlighting distinct patterns in their utilization. Based on the findings, four distinct student types can be discerned, each reflecting unique practices when interacting with language-aware materials.

Initially, students demonstrated appreciation for definitions, particularly when encountering unfamiliar terms. Moreover, the "Motivated" cohort not only utilized definitions for comprehension but also to refine their expression, thereby streamlining the writing process. This multifaceted utility underscores the potential benefits of definitions in geography classrooms. However, uptake of this resource was limited, notably among "Overestimators," who perceived it as overly lengthy. Future iterations could enhance utility by offering concise definitions supplemented with visual aids, aligning with Ulrich's (2023) recommendation of using concept maps to elucidate new terms and their interrelations. Exploring students' preferences for different methods of introducing new terminology warrants further investigation in subsequent research.

Secondly, checklists garnered positive feedback as a time-efficient tool for self-assessment during and after writing tasks. Kumar and Thomas (2023) similarly found that students value checklists for their structural guidance and self-evaluation benefits. This study reinforces the efficacy of checklists as aids for structuring and evaluating language-aware tasks, appealing broadly to "Overestimators," "Selectives," and "Requestors."

Moreover, tables and phrasing support were favored for their role in simplifying the writing process. Dieni (2022) notes the efficacy of guiding questions in supporting text production, a finding echoed here where students benefitted from structured phrasing aids alongside guiding questions, which helped minimize errors.

Model texts emerged as a valuable resource for providing templates that structure localizations and enhance writing confidence. However, their utilization was limited, often due to perceived time constraints. Genre-based instruction, prevalent in foreign language settings (Lee, 2023; Serwene, 2017), demonstrates potential applicability in geography education, emphasizing the need for explicit guidance on leveraging model texts effectively. This underscores the importance of instructional strategies that maximize the utility of language-aware materials, benefiting both educators and students.

5.2. Educational Needs through the Students' Eyes

This section addresses students' educational preferences, highlighting specific instructional requirements in geography classrooms. Each identified need is examined, with implications discussed for fostering a student-centric learning environment.

Students expressed a strong desire for integrated phrasing support and structural aids, such as checklists, during geography writing tasks. Implementing collaborative tasks where students engage with content and receive tailored phrasing support could enhance articulation of solutions (Düppe, 2013). Budke and Kuckuck's (2020) study on university students supports the efficacy of using tables with combined content and phrasing support, findings aligned with this study's emphasis on tailored support formats familiar to students. The study underscores the importance of distinguishing between content-related and structural support, aligning with Budke and Kuckuck's (2020) findings. This differentiation enhances students' ability to articulate knowledge effectively, reducing the overwhelm experienced by "Requestors" and "Selectives" who benefit from structured support frameworks. Students expressed a clear preference for model texts, or mentor texts (Serwene, 2017), as instructional tools that provide clear task structures and expectations. Effective model texts should not only outline generic structures but also incorporate linguistic elements to maximize student benefit (Wallden, 2020). Discussion of model texts in class settings could further enhance student engagement and understanding, particularly among "Requestors" who seek but may underutilize these resources.

Moreover, students emphasized the need for increased writing practice in geography lessons, particularly for tasks like localizations required in their final examinations. This echoes Oswald's (2014) findings on the benefits of integrating writing opportunities in geography education. Steingrübl and Budke (2022) advocate for creative writing opportunities alongside material-based assignments, further broadening students' writing skills repertoire. This study's findings emphasize the importance of structured writing exercises that align with student expectations and assessment requirements.

Additionally, students articulated a desire for comprehensive feedback on written tasks, primarily from geography teachers. Introducing alternative feedback methods, such as peer feedback (Morawski & Budke, 2019), could offer additional benefits by facilitating peer learning and improving text quality. This collaborative approach could particularly benefit "Motivated" students, who are open to new supports and can provide constructive feedback to "Overestimators" seeking to enhance their assignments.

5.3. Limitations

Methodologically, this study encountered limitations related to the depth of responses in open-ended pre-test questions, occasionally resulting in insufficient justifications for material usage or feedback. Addressing these procedural challenges could yield more robust findings in future research. Multilingual materials, as suggested by Repplinger and Budke (2022), could also enhance engagement and outcomes in geography classrooms, particularly among linguistically diverse student populations. Expanding sample sizes and diversifying participant demographics would further enrich understanding of student attitudes and practices with language-aware materials across educational contexts.

In conclusion, this exploratory case study provides valuable insights into students' preferences and practices with language-aware materials in geography education. These insights are pivotal for educators and researchers seeking to develop effective instructional strategies aligned with student needs. Tailoring materials and instructional approaches based on student feedback fosters an inclusive learning environment that enhances educational outcomes in geography education and beyond.

6. Conclusion

Addressing the limitations highlighted in the critique, future studies should conduct a more comprehensive analysis of students' material utilization and its correlation with achievement levels. This entails a rigorous examination of linguistic support' effectiveness, considering differential impacts on actively engaged students versus passive ones. Future research could enhance the comparison between pre- and post-test



surveys and provide additional details on the classification of open-ended responses. Moreover, advancing the sophistication of the bar charts and linking students' classifications with their material usage could enrich the discussion, fostering a more comprehensive understanding of the relationship between students' perceptions and their engagement with language-aware materials. Aligning conclusions with the presented information ensures consistency and strengthens the study's validity. Additionally, an expanded methodological approach, beyond solely relying on student surveys, is warranted. Furthermore, future research could benefit from a more nuanced investigation, including exploring pre-surveys to establish baseline understanding and comparing them with post-survey results. Such a comparative analysis would provide valuable insights into linguistic support' efficacy over time and enable a more robust evaluation of their impact on learning outcomes. Despite challenges posed by the limited participant pool, efforts should be made to incorporate these methodological enhancements for comprehensive and reliable findings. In conclusion, future research should prioritize addressing these identified limitations to enhance validity and reliability in geography education. Adopting a rigorous, multifaceted approach can advance understanding of linguistic support' effectiveness in map interpretation and communication, refining pedagogical practices. Previous research mainly focused on specific language-aware materials or methods in geography classrooms. However, it lacked a thorough investigation into student preferences and practices with these materials. This explorative case study fills this gap by providing various language-aware materials for students to choose from for writing localizations in geography. Through a survey, students provided reasons for the helpfulness or lack thereof of these materials. The central findings highlight linguistic support students found beneficial in navigating maps in geography education. Visual descriptors, comparative language, directional terminology, and scale awareness emerged as valuable tools, empowering students to articulate observations, analyze spatial relationships, and comprehend map significance. Incorporating these supports can enhance map interpretation and communication proficiency, deepening understanding of geographic phenomena. These findings have implications for future research, as understanding preferred and helpful materials is crucial. Additionally, four distinct student types were identified, differing in approaches and motivations. Future studies should investigate whether these types apply to larger student groups and to what extent practical implications positively influence language use. In summary, this study offers insights for research, teachers, and policymakers to create inclusive, effective multilingual learning environments.

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