Unveiling Diversity and Challenging Stereotypes: A Critical Examination of Geography Education

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List of Abbreviations

DGfG	Deutsche Gesellschft für Geographie (German Society for Geography)
Econ. Sts.	economic Status (ökonomischer Status)
Educat. Background	educational background (Bildungshintergrund)
Et al.	et alii
Ethni	ethnicity (Ethnizität)
EV	Eigenvalue
EVC	Eigenvalue Centrality
IGU.CGE	Commission on Geographical Education of the International Geography Union
KMK	Kultusministerkonferenz (The standing Conference of the Ministers of Education and Cultural Affairs)
RQ´s	research Questions (Forschungsfragen)
Fam. Sts.	family status (Familiärer Status)
Fam. Orig.	family origin (Familäre Herkunft)
Soc. Sts.	social Status (Sozialer Status)
UK	United Kingdom
UNESCO	United Nations Educational, Scientific and Cultural Organization (Organisation der Vereinten Nationen für Erziehung, Wissenschaft und Kultur)
UMR divers	Projekt, über welches die Finanzierung läuft – Uni Marburg divers. Gefördert durch das Hessische Ministerium für Wissenschaft, Kunst und Kultur. Untergeordnet dem Teilprojekt Quis – Qualität in Studium und Lehre in Hessen. (Project through which the funding is managed – University of Marburg, "divers." Funded by the Hessian Ministry of Science, Art, and Culture. Subordinate to the subproject Quis – Quality in Studies and Teaching in Hesse.)
US	United States
VDSG	Verband Deutscher Schulgeographen (Association of German School Geographers)

1 Introduction

Diversity in society is real (Banks, 2016; Pevec & Schachner, 2019; Pozas et al., 2020; UNESCO, 2006; Verdeja Muñiz, 2020), and thus German classrooms reflect this diversity (Pevec & Schachner, 2019). A one-dimensional view and inadequate representation of diversity often lead to stereotyping (Davidson & Liu, 2020; Grabbert, 2010), othering (Lippert & Mönter, 2021), Eurocentrism (Nagre, 2023; Tastan et al., 2016; Zabel, 2022) and postcolonial representation of cultures and countries (Hong, 2009; Risager, 2021). This issues highlight the importance of adopting a multidimensional perspective on diversity. Vertovec first introduced the concept of super-diversity in 2007, which particularly addresses the aspect of multidimensionality inherent in globalization and migration flows. An individual not only has a national origin but also possesses a gender, an educational background, a family heritage, and many other characteristics, all of which can manifest in diverse ways.

At the Philipps-University of Marburg, the project UMRdivers brings together staff from 13 subject areas in teacher education for secondary schools to address diversity (Center for Teacher Education Marburg, 2022). Two core objectives guide the project: adapting teacher education to reflect diverse student populations and preparing future teachers for diverse school environments (Center for Teacher Education Marburg, 2022). My doctoral research, associated with the Department of Geography, aligns with the second objective, aiming to equip prospective teachers with the skills to professionally address students diversity.

In Marburg, the strong integration of the Marburg practical modules in the *reflective professional expertise* (Meister et al., 2020) provides a dual perspective on practice. Subject knowledge serves as both a foundation for teaching-related experiences and a basis for the professionalization process of future teachers (Meister et al., 2020). Consequently, I first examine what diversity entails within the specific context of geography as a crucial step in the professionalization process.

The field of geography offers particulary rich context for examining diversity, considering the discipline's origins and development within the framework of colonialism (Gräbel, 2012; Oswin, 2020). Institutionalized geography in Germany, rooted in the colonial ambitions of the German Empire, requires critical engagement of its historical entanglements and enduring continuities (Gräbel, 2012). Colonial structures were particularly evident in geography through a strong Eurocentric and Western worldview that dominated the discipline for a considerable time, persisting even after formal colonialsm ended (Oswin, 2020). This legacy was especially evident in the stereotyping of Africa, which was often reduced to narratives of poverty, disease, and chaos (Kaplan, 1994; Mercer et al., 2003).

Current curricular requirements for geography in the federal state of Hesse (Germany) (Hessian curricula, 2021; 2023) and the current national educational standards (German Society for Geography [DGfG], 2020), aiming for the opposite: Geography as a school subject is intended to

promote intercultural competence, enabling students to engage with different cultures through perspective-taking and to overcome prejudices and stereotypes. Learners are expected to develop the ability to recognize diversity through conscious perspective shifts and understand that perceptions of space are inherently subjective. By practicing perspectives shifts, students are also trained to critically assess Eurocentric viewpoints (DGfG, 2020; Hessian curricula, 2021, 2023).

In conclusion, considering the required focus of diversity in school geography and the discipline's historical Eurocentric perspectives and stereotyping underscore the question: Is there a tension between the requirement for diversity and the persistence of stereotyping in geography education?

1.2 Theoretical framework

The concepts, approaches, and discourses on this topic are diverse themselves, and it is first necessary to organize and determine specific theoretical concepts and discourses that will provide a foundation for this work. These will be derived and further developed to the extent that the analyses can provide insights into considering diversity within our subject areas.

1.2.1 Multiculturalism, diversification, and super-diversity

Berry and Ward (2016) characterize multiculturalism through three central features: a demographic characteristic, a political aspect, and a belief in the value of diversity. The demographic characteristic refers to the diversity within society, which is reflected in religion, language, ethnicity, and other national traits (Berry & Ward, 2016). The political aspect is a normative response to this diversity and includes laws that promote the fair participation of all societal groups (Safdar et al., 2023). The concept of multiculturalism is now subject to considerable criticism, as it promotes limited and rigid notions of ethnic groups and cultures (Scherr & Inan, 2018; Vertovec, 2023) which leads to individuals being reduced to their group affiliations, neglecting the complexity and diversity of individual identities (Scherr & Inan, 2018). It can be seen as a form of "internal colonialism," fostering inter-ethnic competition, inadequately addressing inequality, and thus failing to serve as a contemporary framework (Vertovec, 2023). Additionally, criticism of multiculturalism argues that it fosters parallel societies between immigrant and majority populations. Due to the complexity and multifaceted nature of contemporary migration processes, such as those driven by globalization, the concept needs to be reconsidered and is no longer seen as an adequate framework (Vertovec, 2010).

Diversity concepts emphasize the importance of various social lines of differentiation, such as those highlighted by Allemann-Ghionda (2014), which refer to characteristics like age, gender, sexual orientation, religion, and social class, all of which can mutually influence each other. Critical diversity concepts take it a step further by calling for an offensive self-perception and engagement with

stereotypes (Scherr & Inan, 2018). The consideration of characteristics leads to an even broader concept for adequately capturing the diversity of our societies: the multidimensional historically and politically diverse categories and their mutual conditioning which aligns with the concept of super-diversity by Vertovec (2007).

Diversification and super-diversity differ in their perspectives on difference: while diversification tends to activate stereotypes and generate antagonism due to its reliance on a one-dimensional view of difference, super-diversity approaches social processes as flexible, multidimensional, and characterized by overlapping personal and group identities (Vertovec, 2023). This perspective aims to challenge entrenched assumptions about difference, which are rooted in modernist nation-building efforts in Western Europe since approximately 1750 (Vertovec, 2023). Moreover, the old, entrenched assumptions of a one-dimensional view continue to perceive diversity as an exception, with homogeneity positioned as the norm (Vertovec, 2023). The difference between diversity and super-diversity lies not in the number of categories, but in their simultaneous and mutual interaction (Vertovec, 2023).

A diversity model by Gardenswartz & Rowe from 2003 (s. Figure 1.1), can be referenced as displaying various characteristics of individuals at different levels: At the center of the model is the individual. Based on this, the individual's own internal and external characteristics that also differ in their convertibility. Internal dimensions are innate characteristics that are more difficult to change than external dimensions, which are acquired characteristics. Since the organizational level is irrelevant to my research interests, I will exclude it here.

Although the model originally comes from diversity management in companies, it can also be applied to the educational context, as some studies have done before (Karay et al., 2018; Naaman, 2021). For my theoretical framework and my intention to investigate what considering diversity and handling it on a professional level means, this model serves as a good foundation to represent and examine multidimensionality in terms of super-diversity.

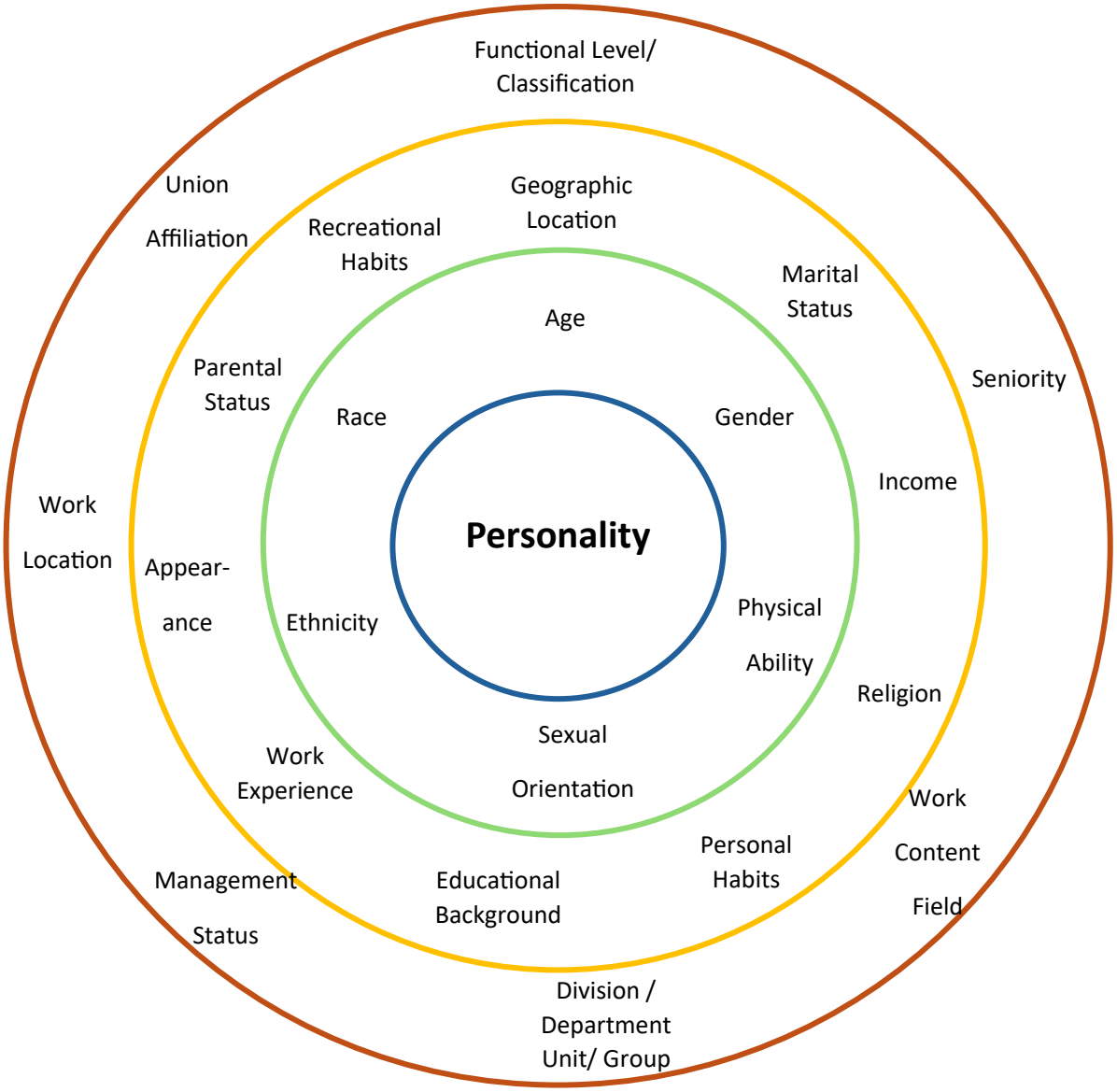

Figure 1.1: Diversity Model "Workforce Diversity" (own illustration based on Gardenswartz & Rowe, 2003).

1.2.2 Geography education & super-diversity

Integrated in the Hessian curriculum of geography for upper (11-13) and lower and middle grade (5-9) is a comprehensive framework designed to equip students with the skills and knowledge necessary to navigate and contribute to a complex, diverse, and globalized world (Hessian curricula, 2021, 2023). This curriculum is divided into one for lower and middle grades (5–9) and another for upper grades (11–13). The diversity-related requirements are further elaborated and summarized below, separated into lower-middle, and upper grades.

Lower & middle grade

The curricula aim to make students aware of their responsibility in shaping their own lives, recognizing their rights, interests, limits, and needs, and understanding social reality in its diversity and

contradictions (Hessian curricula, 2021). A didactic focus of the curriculum is on building a differentiated and appropriately complex view of the world (Hessian curricula, 2021). In geography class, this is achieved by encouraging students to recognize and assess diversity through conscious shifts in perspective (Hessian curricula, 2021). This approach is designed to build on learners' existing experiences while promoting interconnected and global thinking (Hessian curricula, 2021). The curriculum also emphasizes the importance of equipping students to actively shape an ecologically sustainable, economically viable, and socially just environment, considering global aspects, democratic principles, and cultural diversity (Hessian curricula, 2021).

Upper grade

A key aspect is its emphasis on self-perception and reflection. Students are encouraged to perceive and reflect on their intellectual abilities and empathy (Hessian curricula, 2023). This reflective process is crucial for developing a deep, personal connection to the material being studied and for fostering a more comprehensive non-Eurocentric understanding of the world (Hessian curricula, 2023).

It can be derived, that current curricular guidelines emphasize the inclusion of diverse, non-Eurocentric perspectives and the promotion of numerous competencies that strengthen e.g., intercultural understanding. This is primarily justified by the fact that the subject of geography, in comparison to other subjects, significantly focuses on representing the world and therefore should have a fundamental basis in diversity, ensuring a multifaceted and diverse representation of the world (Milner et al., 2021). Conversely, Eurocentrism and stereotyping should be avoided. Since Eurocentrism cannot be viewed separately from colonialism (Zabel, 2022), it is important to examine both concepts and their (current) influence on geography.

1.2.3 Colonization and stereotypes in geography education

Eurocentrism describes a worldview that regards European values and norms as superior and creates a binary thinking between Europe and the USA in their dominant role and "the barbaric Other" (Franzki, 2012). This worldview forms the ideological foundation of colonialism, as the notion of European (and U.S.) superiority legitimized the exploitation and enslavement of people in colonized regions, particularly through the construction of race and the associated belief in the inferiority of indigenous or Black populations in the colonies (Zabel, 2022).

Colonialism represents approximately 500 years of European dominance and exploitation in the Global South, influencing both material resources and the knowledge and belief systems of colonized societies (Zabel, 2022). Addressing its ongoing impacts requires various perspectives, including decolonial and postcolonial approaches, which aim to reveal continuities. However, postcolonial frameworks risks blending ongoing presence and existence (Stoler, 2016), thereby failing to fully capture the material and intellectual dimensions of colonial power (de Leeuw & Hunt, 2018).

This often prevents interrogation of the obvious contemporary colonial structures, places, and practices (Barnett, 1995).

In the field of geography, these critiques acquire particular significance because the discipline is historically rooted in colonial, racist, and partiarchical ideologies that have profoundly shaped its development (Oswin, 2020). A core issue of Eurocentrism is the perpetuation of coloniality in geography, marked by the dismissal of non-Western and indigenous knowledge systems (Laing, 2021). In Germany, geography was formed by classical regional geography as a substantial part and heavily criticized for its roots in obsolet values and colonial knowledge systems: a central event in this context was the 1969 Kiel Geography Congress, where student protests called for a paradigm shift (Helbrecht, 2014; Korf, 2014; Korf & Wardenga, 2021; Weichhart, 2016). Classical regional geography faced criticism for its lack of scientific stringency, relying on descriptive methods and avoiding critical, interdisciplinary questions (Berliner Geographenkreis, 1969; Haversath, 2020). Moreover, its ideological underpinnings, such as “homeland studies" from the Nazi era (Haversath, 2020), reproduced colonial knowledge for decades (Oswin, 2020). The shift toward spatial science aimed to replace static, pseudoscientific approaches with dynamic, globalized perspectives (Korf, 2014; Weichhart, 2016). The paradigm shift also demanded many changes for the subject of geography, which was also strongly influenced by regional geography (Haversath, 2020). This includes the revision of curricula (Haversath, 2020). Despite progress in problem-oriented education, colonial legacies persist, highlighting the need for decolonization (Radcliffe, 2017). However, geography risks reinforcing binaries like Colonial–Postcolonial, Center–Periphery and Past–Present (Gilmartin & Berg, 2007).

Stereotypes play a key role in perpetuating these colonial legacies. They can be described as mental images that individuals use to categorize their perceptions of others (Hummer, 2014). People assign specific characteristics to both their own and foreign groups and are always accompanied by generalizations (Hummer, 2014). The problem arises because stereotypes are often inaccurate (Lippmann, 1992), and particularly negative stereotypes can have far-reaching consequences (Martiny & Froehlich, 2020), such as fostering discrimination (Barrera Mora & Cantor Trujillo, 2007).

Stereotypical representations of colonized populations, often of racist nature, accompanied colonialism (Natermann, 2023). These stereotypes reflected traditional white perceptions and a Eurocentric worldview (Natermann, 2023). Since the field of geography emerged from colonial knowledge, this suggests a close interconnection with the accompanying stereotypes concerning non-white individuals in the discipline, a connection that Natermann has generally derived through her research (2023).

To counter postcolonial theory, a focus on decolonization is critical to rearticulate the discipline of geography (education) by addressing security concerns, political imperatives, and colonial-

modern frameworks (Radcliffe, 2017) and to focus on dismantling colonial legacies (Laing, 2021). There is already a growing influence in this direction, particularly from feminist, queer, and anti-racist geographers (Laing, 2021; Radcliffe, 2018). In general, both Southern knowledge systems must be more fully integrated, and there must be greater representation of non-white, non-Western knowledge productions in teaching (Laing, 2021). A broader consideration of diversity can promote decolonization (Laing, 2021).

However, these alternative representations to knowledge productions are currently treated as "additions" rather than equal (Nursey-Bray, 2019). This implies paying attention not only to what is taught but also to how topics and ideas are taught (Laing, 2021). This can be achieved by ensuring diversity in teaching staff, decolonizing assessment criteria, embedding decolonization in curricula, and using innovative teaching materials. Despite these efforts, it remains unvertain whether geography has sufficiently addressed these issues as of 2024.

1.3 Research aims

Building on this foundation of fundamental didactic concepts, subject-specific pedagogical developments and requirements, as well as the societal discourse on super-diversity, this study aims to analyze how diversity is currently addressed within the field of geography education. This includes examining how individuals and groups of individuals are represented and to investigate the current significance of stereotyping in geography education.

Therefore, the following step-by-step approach appears suitable: Diversity must be addressed on the subject-specific level, as professional engagement with diversity—and thus the goal of the UMRdivers project—requires establishing a solid subject foundation as a cornerstone to the professionalization process (Meister et al., 2020). Additionally, UNESCO (2017), and the Federal Commissioner for Migration, Integration, and Refugees (2015) advocate for the representation of diverse identities in educational materials, due to the increasingly diverse students, also in German school classes. This serves a starting point in my study: an examination of geography textbooks for the representation of diversity on a multidimensional view. This expands the concept of super-diversity to the educational context (super-diversity) (Paper 1). Furthermore, it is essential to determine whether there is a connection between the representation of diversity and specific countries or continents (Paper 2). As teachers are the most significant factor in student success (Hattie, 2009), the study will also include teachers' assessments regarding the persistence of stereotypes in geography education (Paper 3).

The following specific objectives can be derived from these research ideas:

- **Paper 1:** Analysis of geography textbooks for the representation of super-diversity, assessing the inclusion of various identities and their portrayal within the geograpy educational context.
- **Paper 2:** Examination of connections between the consideration of super-diversity and the representation of countries and continents to explore and identify possible patterns in the representation of our world leading to specific biases.
- **Paper 3:** Semi-guided interviews with teachers to evaluate their views on the persistence and impact of stereotypes in geography class, challenges, and their strategies to address them.

1.4 Methods & paper overview

This dissertation employs a mixed-methods approach across three coherent studies to investigate how diversity is considered in geography education. The studies are published in three international peer-reviewed scientific journals, offering a comprehensive insight into the object of investigation and creating a coherent framework for understanding diversity and stereotyping in geography education (see Figure 1.2). First, this should be explored through a qualitative textbook analysis. Secondly, I interviewed teachers, as they are the most important factor for students in the classroom (Hattie, 2009) and thus play a crucial role in addressing stereotyping.

Diversity has been a focal point in previous research, particularly in the fields of work and business. In the context of globalization and increasing migration, the diversity in German school classrooms underscores the project's goal of placign greater professonial emphasis on diversity. The foundation of the first study is the adaptation of the "Workforce Diversity Model" by Gardenswartz and Rowe (2003) to a geography-specific context, enriched by the concept of super-diversity.

Textbooks, as one of the primary mediums still used in geography class (Lathan, 2021; Brucker, 2012), have a significant role in this approach for the following reasons: Firstly, textbooks are essential for building students´ knowledge, e.g., in the form of values, behaviors, and attitudes (Lee et al., 2021; Tabatadze & Gorgadze, 2023). Secondly, they develop students´ identity toward different sources of cultural and gender identity (Tabatadze & Gorgadze, 2023) and thirdly, an imbalanced representation fo diversity in textbooks could reinforce social inequalities and racial divides (Davidson & Liu, 2020; Fang & Baker, 2018; Huh & Suh, 2018).

Admission procedures ensure that the educational standards are met (Hessian School Law, 2023/In the version of the announcement dated March 31, 2023). However, Hesse is one of a few federal states with an admission procedure for textbooks in lower, middle, and upper grades (Hessian Ministry of Education, 2013). I focused on Hessian textbooks as they are officially approved and do not only rely on the publishers quality checks. Furthermore, the UNESCO (2017) and Federal Commissioner

(2015) emphasize in their requirements for reflecting real diversity among students, the identities represented in textbooks must also portray a diversity that aligns with students' reality. Therefore, a textbooks analysis offer a valuable opportunity to analyze geographical content in terms of representing dimensions of diversity.

The textbook analysis aims to examine the extent to which diversity is represented in the subject content. Therefore, an analysis of all licensed textbooks in Hesse was conducted, using qualitative content analysis according to Kuckartz & Rädiker (2024). The results were additionally quantitatively evaluated which is why it can be described as a mixed-methods approach (Kelle, 2022). A coding framework was created using a deductive-inductive category system, iteratively refined for application to textbook data. With specific coding rules, this framework was applied to 4,689 coding units identified through headings, sub-headings, and paragraphs. Categories were assigned to each unit, noted as unassigned, single-assigned, or multi-assigned. Intercoder reliability was confirmed by a Cohen’s Kappa at 0.82 based on coding of 34% of the material by a second coder. The quantitative analysis of these results offered an initial assessment of diversity consideration in geographical content through a multidimensional diversity model, confirming the occurrence of the analyzed diversity dimensions. This study thus provides a valuable overview of the current representation of diversity in geography textbooks, revealing a strong dependence on the subject matter and grade level, as well as a significantly different frequency distribution of the dimensions. Specifically, external dimensions are depicted much more frequently than internal ones.

Building on the findings of Paper 1, the second study applied the diversity model to analyze how diversity dimensions relate to countries and continents in Hesse's licensed geography textbooks. Using qualitative content analysis by Kuckartz & Rädiker (2024), all country and continent mentions were coded using the framework from Study Paper 1. A second coder reviewed 34% of the data, achieving an intercoder reliability of 0.8 (Cohen’s Kappa). A quantitative outcome measure then highlighted the occurrence of diversity dimensions by countries and continents, visualized through anamorphosis. A network analysis, with diversity dimensions as nodes and their co-occurrences as edges, used Rstudio software to generate network graphs. Eigenvalues and centrality measures identified diversity patterns by continent, excluding Oceania due to insufficient data. The analysis reveals a clear bias in the representation of our world in geography textbooks. Africa, in particular, was depicted in a highly homogenized and one-dimensional manner, as the only continent where economic status was the sole dimension of high centrality, whereas at least 4-5 dimensions held central importance for other continents. Additionally, disability held a higher centrality within the African network than for any other continent, quantitatively supporting assumptions from previous studies that African representation is often reduced to poverty and disability—still reflected in current textbooks.

Since textbooks suggest stereotypes, teachers at various stages of their professional development will, on the other hand, be interviewed to assess the actual significance of stereotyping in geography instruction. Teachers are the most influential factor in students' learning success (Hattie, 2009), which is why they are best positioned to shed light on the presence of stereotypes, the challenges, and strategies for addressing this issue. To avoid bias in teachers' responses and thus in the conclusions, teachers of different ages, levels of professional experience, school types, and secondary subjects were interviewed. An exploratory guideline was developed based on theory and identified research gaps, allowing for the creation of an inductive category system. I chose a qualitative content analysis following the approach of Kuckartz and Rädiker (2024) and subsequently quantified the categorizations for improved clarity.

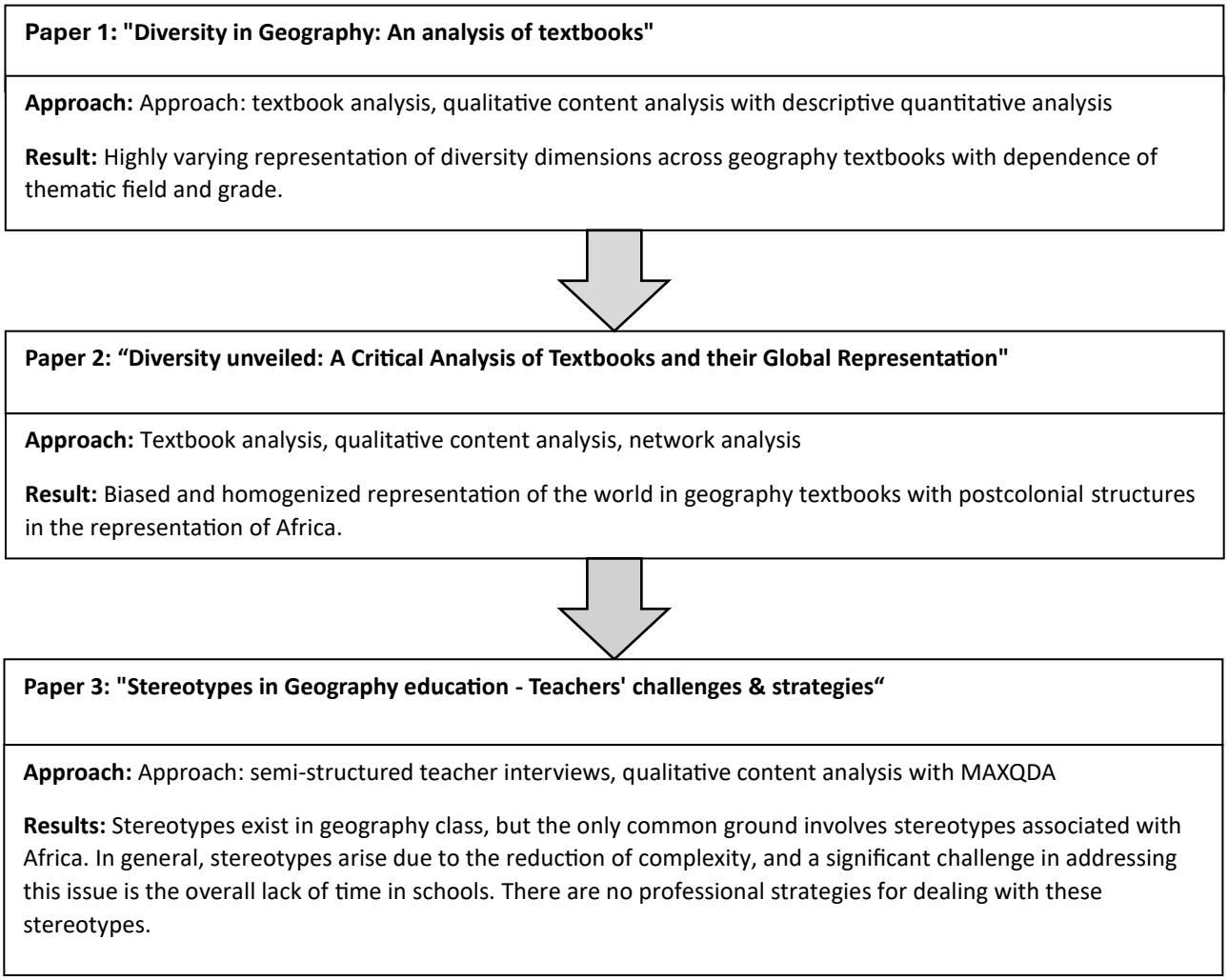

Figure 1.2: Thesis structure.

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2 Diversity in Geography – An Analysis of Textbooks

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Abstract

Diversity can be defined as multidimensional as it involves considering the diverse characteristics of individuals and societies. Geography as a subject has great potential to teach about diversity in a sensitive manner because diversity addresses complex interactions in spaces on different scales. In times of globalization and migration processes, school students are becoming increasingly diverse. The diverse reality of students' lives must be reflected adequately in education. Thus, both educational standards and curricula demand an adequate representation of diversity, e.g., by reducing stereotypes that are related to different cultures. Thus, it is necessary to discuss the representation of diversity in textbooks within their role as the primary teaching medium in schools in Germany. We use a model with 13 diversity dimensions to assess such representation in geography textbooks. We examined all 11 licensed geography textbooks used in grades 5 to 13 in Hesse, Germany, using qualitative content analysis and analyzed the results quantitatively. Despite all the analyzed dimensions of diversity being found in the textbooks, the results show an inadequate, partly arbitrary, representation of diversity that contradicts the reality of students today. The representation of diversity depends on the topic and is less present in books for lower grades.

Zusammenfassung

Diversität kann als mehrdimensional definiert werden und berücksichtigt unterschiedlichste Merkmale von Individuen und Gesellschaften. Das Fach Geographie hat ein großes Potenzial, diversitätssensibel zu unterrichten, da Diversität komplexe Interaktionen in Räumen auf verschiedenen Skalen anspricht. In Zeiten von

Globalisierung und Migrationsprozessen werden die Schülerinnen und Schüler immer diverser. Die vielfältige Lebenswirklichkeit der Schülerinnen und Schüler muss sich in der Bildung angemessen widerspiegeln. So fordern sowohl die Bildungsstandards als auch Curricula eine adäquate Darstellung von Vielfalt, z.B. durch den Abbau von Stereotypen, die mit unterschiedlichen Kulturen verbunden sind. Aus diesem Grund ist es notwendig, die Darstellung von Vielfalt in Schulbüchern zu diskutieren, da sie das primäre Medium in deutschen Schulen sind. Wir verwenden ein Modell mit 13 Diversitätsdimensionen, um die Repräsentation von Diversität in Geographieschulbüchern zu bewerten. Wir haben alle 11 lizenzierten Geographieschulbücher der Klassen 5 bis 13 in Hessen, Deutschland, mit Hilfe einer qualitativen Inhaltsanalyse analysiert und die Ergebnisse quantitativ ausgewertet. Auch wenn alle untersuchten Diversitätsdimensionen in den Schulbüchern zu finden sind, zeigen die Ergebnisse eine unzureichende, teilweise willkürliche Darstellung von Diversität, die der heutigen Lebenswirklichkeit von Schülerinnen und Schülern widerspricht. Die Darstellung von Vielfalt hängt vom Thema ab und ist in Büchern für untere Klassenstufen weniger präsent.

Keywords: diversity, dimensions of diversity, geography teaching, textbooks, qualitative content analysis

2.1 Introduction

Diversity-sensitive teaching is beneficial for the following reasons: It positively effects students socially and emotionally (Pevec & Schachner, 2020) and leads to higher motivation and psychological well-being (Schachner et al., 2016) as well as positive attitudes toward ethnic groups (Juvonen et al., 2018). Thereby, intergroup contacts in class account for a reduction in stereotyping (Pevec & Schachner, 2020). Consequently, diversity is enriching (Wearmoth, 2017; Dhungana, 2020). Moreover, differences in school achievement between immigrants and non-immigrants decrease with positive attitudes toward cultural diversity in schools (Celeste et al., 2019).

In the context of globalization and migration, but also due to changing values and social movements, societies and school classes are becoming increasingly diverse (Stoicovy, 2002; Dollmann et al., 2022; Vertovec, 2021). In Germany, 27% of the population had a migration background in 2021 (Federal Statistic Office, 2022), and in schools, the proportion of children with a migration background is about 33% and is likely to increase (Federal Statistic Office, 2018). This increasing diversity requires a new learning culture that adapts classroom activities to the prerequisites of individuals (Ruin & Giese, 2018).

This rapid change is accompanied by the increasing complexity of the requirements for teaching activities and the need to investigate the relevance of diversity for these activities (Altunas, 2014; Federal Commissioner for Migration, Integration, & Refugees, 2015). This paradigm shift and the relevance of diversity issues in society, politics, and education claim a fundamental recognition and appreciation of diversity (Block et al., 2017). Since 2012, the Hessian Ministry of Education and Cultural Affairs in Germany has demanded a corresponding approach and the consideration of diversity in the sense of individual support. However, students with a migration background still have a disadvantageous educational situation compared to their peers without one (Abacioglu et al., 2019).

Internationally, especially in the U.S. and as a result of the country's immigration history, requirements have existed for decades regarding culturally sensitive pedagogy (Stoicovy, 2002). Culturally sensitive pedagogy can be defined as "(…) a student-centered approach to teaching that includes cultural references and recognizes the importance of cultural backgrounds and experiences in all aspects of learning" (Samuels 2018). Teacher training should include culturally sensitive pedagogy (Stoicovy, 2002) since the school culture could differ from students' cultural backgrounds (Stoicovy, 2002). Houtsonen (2002) specifies ethnic, racial, and cultural diversity, especially in the subject of geography. Geographic education should achieve an understanding of global cultures (Houtsonen, 2002). The *International Charter on Geographical Education* emphasizes the importance and potential of this subject in the diversity discourse by the following aspect of the contribution of Geography to education: "Understanding and respect for all peoples, their cultures, civilizations, values and ways of life, including domestic ethnic cultures and cultures of other nations (International Geographical Union (IGU.CGE), 1992, p. 13)." A lack of diversity and inclusion is identified even in the U.S., despite its history of immigration (Gates et al., 2019).

With regard to German educational standards, the subject of geography has various requirements related to the adequate handling of diversity (German Geography Society (DGfG), 2020; Hessian Curricula, 2021; 2022). The Hessian curricula define diversity as an independent competence area (Hessian Curricula, 2021; 2022). The national standards and the Hessian curricula demand that cultural diversity is considered during the active configuration of a sustainable environment (DGfG, 2020; Hessian Curricula, 2021; 2022). However, in general, projections about concepts of cultural diversity have been very insufficient in German schools and resemble mainstream culture (Civitillo et al., 2019). Without appropriate consideration, neither equity nor pluralism can be promoted (Civitillo et al., 2019).

Textbooks play a significant role in imprinting the image of a particular social group through their visual and textual representation (Federal Commissioner for Migration, Integration, & Refugees, 2015). This enhances stereotyping. Moreover, textbooks transfer society's values, norms, attitudes, and behaviors (Pogorzelska, 2016). Thus, they are an important source of cultural elements (Wen-

Cheng et al., 2011). Textbooks should therefore be didactically devised to benefit the required multiperspectivity (Federal Commissioner for Migration, Integration, & Refugees, 2015). The federal government has explicitly remarked that textbooks must reflect the reality of students' lives in all content to represent social diversity (Federal Commissioner for Migration, Integration, & Refugees, 2015).

An analysis of the current representation of diversity is inevitable to support diversity-sensitive teaching in German geography education. So far, an analysis of geography textbooks based on the broad diversity dimensions derived from the literature is missing. This study will analyze geography textbooks according to these diversity dimensions to fill the existing research gap.

2.2 Theoretical framework

2.2.1 Diversity and diversity dimensions

Diversity generally refers to individuals representing more than one national origin, skin color, religion, economic status, etc. (Omer, 2021). These different characteristics are usually conceptualized as different diversity dimensions (Bührmann, 2021). Focusing on a single dimension of diversity is criticized in the context of the "transformative diversification of diversity" brought by migration (Vertovec, 2007). Within the concept of super-diversity, these diversifications include a wide variety of dimensions, which are all related to and mutually presuppose each other (Vertovec, 2007). Therefore, this paper will focus on a wide variety of dimensions. One of the best known models (Karay et al., 2018; Demartoto, 2018) for a simple representation of different diversity dimensions is the 4 layers of

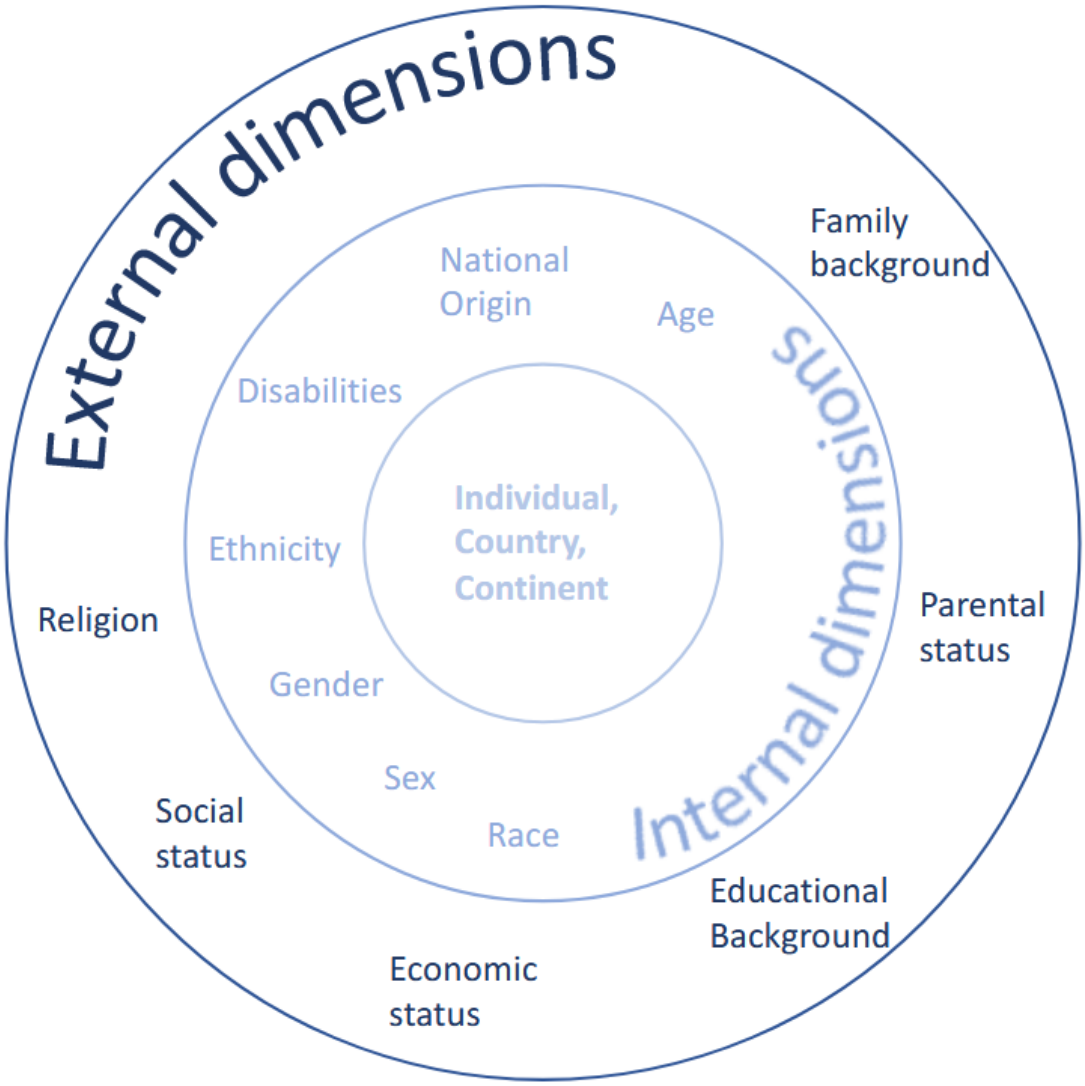

Figure 2.1: Dimensions of diversity (own illustration 2023; based on Gardenswartz & Rowe, 2003).

diversity model by Gardenswartz and Rowe (2003): (1) The innermost level represents the individual/personality (Gardenswartz & Rowe, 2003). (2) Internal dimensions define a person's physical and characteristic features, which are difficult to change and therefore usually referred to as core dimensions (Franken, 2015; Bührmann, 2021). The internal dimensions are represented in the General Equal Treatment Act 2006 and Charter of Fundamental Rights (EU) because they are at the core of historical inequality treatments (Meier 2022). (3) External dimensions describe changeable, secondary characteristics of individuals that represent the results of experiences and decisions (Bührmann, 2021). (4) The outermost level comprises organizational dimensions (Gardenswartz & Rowe, 2003). Although the model originates from diversity management in companies, the classification of the dimensions, the level of detail, and the representation of different levels have been used in higher education contexts with only slight modifications (e.g., Karay et al., 2018; Naaman, 2021).

We created our own model that was inductively adapted to the material following the classification of internal and external dimensions by Gardenswartz and Rowe (2003) (Fig. 2.1). Because

the focus is on the representation of diversity in describing individuals, countries, and continents in geography textbooks, these are in the middle of our model to illustrate the target of analysis. The organizational dimensions are not relevant in this context.

2.2.2 Textbook analysis in the content of diversity

A wide range of studies exists on the representation of dimensions in educational media, such as textbooks. For decades, diverse analyses of various aspects, research currents, and studies on single or multiple diversity dimensions have been conducted. This applies not only to the general study of these aspects but also to their representation in the textbooks of different subjects and countries.

Grabbert conducted an analysis of migration and its representation in German textbooks (2010). In addition to geography textbooks, the study considered social studies, history, historical-social world studies, politics, political economics, physical education, values and norms, and philosophy textbooks (Grabbert, 2010). The results showed an inadequate and one-sided representation of migrants in textbooks, resulting in a reinforcement of supposed cultural stereotypes (Grabbert, 2010). In the context of migration, studies concerning the issue of interculturality specify various aspects of diversity, such as cultural diversity, and more specifically, ethnicity, race, and national origin (Zhang et al., 2022; Davidson & Liu, 2020). These international textbook analyses are consistent with the results of a unidirectional representation in German textbooks. The studies confirm that the students addressed do not experience a realization and representation of the values of a globalized world through the mode of representation used (Davidson & Liu, 2020). This is particularly interesting concerning the dimensions of race, ethnicity, and national origin.

A Canadian textbook analysis of the depiction of race found continuous racist ideologies and false statements (Montgomery, 2005). Only the quantity of these statements decreased in the 2000s compared to analyses of the 1950s and 1960s (Montgomery, 2005). A qualitative content analysis on various aspects of anti-racism, especially on multicultural coexistence and racial and cultural conflicts, was conducted by Mönter and Schiffer-Nasserie (2007) with regard to geography textbooks of Bavaria, Saxony, and North Rhine-Westphalia. A central result is the contrast between “us” (Germans) and “them” (migrants). Consequential alienation as well as the overall low success of the anti-racist pedagogy can be determined based on the qualitative results (Mönter & Schiffer-Nasserie, 2007). In addition, considerable differences were found between the three federal states analyzed (Mönter & Schiffer-Nasserie, 2007). Textbook analyses provide insights into increasingly recognizable static identity concepts, stereotyping, and related unidirectional representations of individuals in textbooks (Allemann-Ghionda, 2013). This salvages the risk of ethnicization and often leads to an unreflective Eurocentric representation of the dominant culture of the educational system, as evidenced by a Portuguese analysis of history textbooks (Araújo & Rodríguez Maeso, 2012). The agrees with the results of the Irish textbook analysis by Usher (2023). The Irish textbooks showing a one-sided and

mostly a homogenization of the whole continent Africa, by only representing Africa in context of disaster, poverty, undeveloped and uneducated (Usher, 2023). Thus, the current instructional media reproduces colonial modes of representation and, thereby, transports racist ideologies (Marmer, 2013; Federal Commissioner for Migration, Refugees, and Integration, 2015; Mönter & Schiffer-Nasserie, 2007).

Static concepts are also found in gender discourse as part of diversity. A Ugandan textbook analysis (subject: English) found that female role models are underrepresented and that the texts often do not include women at all (Barton & Sakwa, 2012). When women are represented, it is associated with a high degree of stereotyping (Barton & Sakwa, 2012). Lucy et al.'s analysis of American history textbooks confirmed these results (2020). Woman are mentioned almost exclusively within the contexts of marriage, home, and work (Lucy et al., 2020). These results contradict the currently demanded gender equality and gender-conscious education in schools and contemporary educational media (Ott, 2021). An American analysis of physical geography textbooks combined two different dimensions of diversity: the representation of race and gender (Bush & Mattox, 2020). The results revealed a limited or even no representation of women of different races and identified gender and racial bias in current textbooks (Bush & Mattox, 2020).

People with disabilities are entitled to universal equality in school and society through the Convention on the Rights of Persons with Disabilities (United Nations (UN) Department of Economic and Social Affairs Disability, 2006; Standing committee of the German ministers of culture, 2011; Abu-Hamour et al., 2019). In Germany, 7.8 million people had a severe disability in 2021, representing 9.4% of the total population (Federal statistic office, 2022). Against this background, Heinemann investigated the appropriate representation of people with disabilities in German English language textbooks (2020). The results show that the statistical value is not reflected (Heinemann, 2020). Moreover, the textbooks do not have a reflective approach concerning disability (Heinemann, 2020). International textbook analyses show the same results (e.g., the Jordanian textbook analysis by Abu-Hamour et al., 2019 and the Spanish study on the representation of disability in sport textbooks by González-Palomares & Rey-Cao, 2022). However, in addition to the purely medical model of disability, a social model, "which views disability as rooted in environmental and attitudinal barriers," has existed for some time (Olney et al., 2004). The social model of disability is particularly interesting with regard to geography education and is included in the analysis of disability as a diversity dimension.

Despite many different, but mostly one-dimensional, views on the development and consideration of diversity in the international school context, the results provide a common direction: They highlight the need to analyze textbooks from a diversity-conscious perspective (Federal Commissioner for Migration, Refugees, and Integration, 2015). Moreover, no study has conducted a comprehensive textbook analysis of a wide variety of diversity dimensions within the subject of

geography. Accordingly, the overarching research concern of this article is dimensions of diversity in geography textbooks.

2.2.3 Geography textbooks in the German educational system

In Germany, secondary education is normally structured based on a lower level (grades 5–6), a middle level (grades 7–10), and a higher level (grades 11–13). Education at all levels is organized within the country's federal states — this includes the configuration of curricula and the admission procedure of textbooks as the primary medium in schools (Bölsterli et al., 2010). Private publishers provide textbooks adjusted to the specifics of each individual state. For standardized reasons regarding the analysis of textbooks and differences between the states. We chose Hesse as it is the only federal state that has permissions for all geography textbooks for every grade.

The German Geography Society defines the aim of the school subject as bridging natural and social sciences under a spatial perspective (2020). This definition results in a broad spectrum of thematic content that considers physical and human geography and human-environmental research. Geography textbooks are structured according to different thematic sequences within these fields (Mönter & Schiffer-Nasserie, 2007).

In Hessian textbooks, governmental approval is only granted when publishers follow the curricular requirements (Heinemann, 2020). Hessian geography education is structured based on two curricula: one for grades 5–10 and another for grades 11–13. Both curricula contain requirements regarding their appropriate handling, including the following:

- capturing social reality in its diversity
- supporting intercultural competence
- adopting different points of view
- building a differentiated and appropriately complex view of the world: In geography lessons, students practice recognizing diversity by changing their perspectives
- including cultural diversity as part of one's judgement competency (Hessian curricula, 2021).

Thus, diversity should find adequate representation in approved textbooks. Since Hesse offers geography education at the three secondary education levels and provides a catalog of approved textbooks, this state provides a good context for a comprehensive analysis.

2.2.4 Research aim and research questions

Our research analyzes the representation of diversity dimensions in Hessian geography textbooks. More specifically, our analysis addresses the following research questions.

Two research questions arise from the theory and systematization of the diversity dimensions:

RQ1: With what frequency do the different diversity dimensions occur?

Existing research has focused on single diversity dimensions. However, with regard to the super-diversity addressed by Vertovec, the dimensions do not act independently, but instead, interact (2007). This implies that a mere representation of the individual dimensions without consideration of the others would not come close to the diversity concept. Thus, we will analyze how the quantities of occurrences differ between the dimensions.

RQ2: Do the dimensions classified as internal and external occur evenly?

The systematization of the internal and external dimensions adapted by Gardenswartz and Rowe (2003) is another aspect of the analysis in this research. External dimensions (e.g., economic status, educational level, social status) are central content of the subject geography (Hessian Curricula 2021 & 2022). Nevertheless, the multiple nominations of internal dimensions in the different regulations implies the appropriate appreciation and representation of these individual aspects. With regard to the super-diversity addressed by Vertovec (2007), the internal and external dimensions do not act independently, but rather, interact.

Two more research questions are proposed regarding the structure of the textbooks:

RQ3: How is the representation of diversity related to the textbook grade?

Hessian textbooks address specific grades (5–6, 7–8, and 11–13). The orientation of the textbooks to specific grades institutes the possibility of differentiated views of diversity dimensions and their occurrence based on the level of secondary education. Thus, we analyze how the occurrence of diversity dimensions is related to the textbook grade.

RQ4: How is the representation of diversity related to the geographical topic?

Contrary to previous research, this textbook study deliberately includes all the approved and licensed geography textbooks in Hesse. Diversity should be addressed in all geographical topics, considering the curricular guidelines of the subject. Because geography textbooks are structured based on different topics, a further focus of analysis is the relationship between diversity representation and these topics.

2.3 Methods

2.3.1 Sampling

The study material comprises all the licensed German-language geography textbooks in the current textbook catalog of Hesse, Germany (as of 01.08.2022) (see Tab. 2.1), the only federal state that has licensed geography textbooks for all grades (5–13). The selection is limited to textbooks and not does not include, for example, map media, such as atlases.

Table 2.1: All the licensed German geography textbooks in Hesse (Source: Hessian Curricula, 01.08.2022).

No.	Title	Publisher	Year of publication	Grade/s
1	Unsere Erde (Gym)	Cornelsen	2018	5–6
2	Unsere Erde (Gym)	Cornelsen	2020	7–8
3	Terra Erdkunde Hessen	Klett	2022	5–6
4	Terra Erdkunde Hessen	Klett	2013	8
5	Seydlitz Geographie (Hessen)	Westermann	2020	5–6
6	Seydlitz Geographie (Hessen)	Westermann	2019	7–10
7	Mensch & Raum	Cornelsen	2016	11–12
8	Fundamente Geographie	Klett	2015	11–12
9	Terra Geographie	Klett	2020	11–12
10	Seydlitz Geographie Hessen	Westermann	2016	10
11	Diercke Geografie	Westermann	2017	11–12

Hessian textbooks have to comply with the curricular requirements. Thus, similar topics are found in all the textbooks. However, the names of the chapters vary slightly. To analyze the occurrence of the dimensions according to the thematic subfields, we assigned the chapters to a topic in two ways:

- Directly = based on identical wording
- Indirectly = based on meaning

Only four of the chapters covered two subfields (3 & 4, see Tab. 2.2). All the coding units within a chapter were accounted for by the respective subfields. The coding units of the four chapters with double classifications were counted twice (once for each subfield). We then calculated the relative occurrence of each subfield. Tab. 2.2 illustrates a description of each subfield and its range of coding units.

Table 2.2: Thematic subfields of analysis.

No.	Thematic subfield	Geographic discipline	Description	Coding units embraced (total: 4689)
1	Planet earth	Physical geography	Natural processes & life on earth; Geofactors; Ecozones	1289
2	Resources	Physical geography	Resources (e.g., energy)	410
3	Economy	Anthropogeography	Agriculture, industry, & services	825
4	Urban & rural spaces	Anthropogeography	Life in urban & rural spaces: Urbanization, peripheral spaces, urban development, & area planning	692
5	Tourism	Anthropogeography	Tourism	93
6	Population	Anthropogeography	Population geography & migration	127
7	Globalization	Anthropogeography	Fragmented world; “One world”; Consequences of globalization & global disparities	975
8	Countries & continents	Anthropogeography	Chapters that are directly focused on a spatial example (country or continent)	707

2.3.2 Content analysis

The textbook content was examined using category-guided text analysis (Guest et al., 2012; Kuckartz, 2019). The core of qualitative content analysis is the deductive-inductive formation of a category system (Kuckartz, 2019). An overview of the research design is summarized in Tab. 2.3.

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Table 2.3: Research design.

Research approach	Qualitative-quantitative (mixed methods)
Data gathering method	Qualitative procedure (Kuckartz 2019).
Sampling	All licensed geography textbooks in Hesse (grades 5–13).
Methods of analysis	Deductive-inductive building of categories according to Kuckartz (2019). Quantitative evaluation: occurrence of each category. Qualitative: reference to the theory.

2.3.3 Coding framework

The dimensions were repeatedly adapted to the material following several runs, resulting in a coding framework. The coding framework includes the definition of each category and specific coding

rules based on the definitions. All the unit sections were assigned according to the coding rules based on the definitions of the subcategories. Tab. 2.4 shows the coding framework. In the analysis, we included the complete text body from our sample by structuring it based on coding units (n = 4689). Each coding unit encompasses self-contained content. To guarantee an objective procedure for defining the coding units, we selected them based on their headings, sub-headings, and paragraphs. We then analyzed the coding units one by one using the coding framework (Tab. 2.3), which specified the diversity dimensions previously derived from the theory on coding categories. All the coding units were analyzed for all the categories. The following three possibilities can occur with this approach:

- the coding unit is not assigned to a category
- the coding unit is assigned to one category
- the coding unit is assigned to two or more categories.

Based on this coding, the absolute occurrence of each category can be recorded. When the coding procedure is completed, the relative occurrence can be calculated. A second researcher coded 36% of the material (4 of the 11 textbooks). The overall intercoder reliability was satisfactory (0.83).

Table 2.4: Coding framework – internal and external dimensions.

Main category	**Subcategory**	**Coding rule**
Internal dimensions	Race	Not represented
		- skin color (black/white) - nations, which are indirectly related to skin color (e.g., Hispanics, Afro-Americans)
	Gender	Not represented
		- gender-specific role models - responsibilities of men and women
	Sex	Not represented
		- biological sex (female/male) is mentioned or arises in the content
	Ethnicity	Not represented
		- ethnic groups/ethnic minorities - groups are depicted that identify as such based on a common culture and/or language and/or behavior - groups with common ancestry - culture, language, values, and norms or a specific ethnicity are highlighted as a cause of or reason for something - cultural diversity is described
	National origin	Not represented
		- migrants or people with a migration background are picked out - national origins of individuals or groups (e.g., “Germans,” “Indians,” “Canadians”) are named in the context of migration - national origin is used for a comparison (e.g., Chinese and South Africans are different/similar in ...) - countries of origin and destination are mentioned - the flow of refugees is mentioned (e.g., “Due to refugee flows to Germany, ...”) - the juxtaposition of national origins by contrasting them using pronouns such as “we” and “the others”
	Disability	Not represented

		- the terms physical/mental or sensory impairments are mentioned. - social impairments are described in more detail using a specific example (countries and continents) (e.g., famines, epidemics, child mortality, natural disasters)
External dimensions	Economic status	Not represented
		- economic crisis/prosperity - low/high GDP - low/high unemployment - lower/higher developed - low/high standard of living - comparison of different economic statuses
	Educational background	Not represented
		- no/low access to education - lowly educated - undereducated labor force; low educated labor force - access to education - more highly educated - skilled workforce; highly educated workforce
	Religion	Not represented
		- religion mentioned as a term - expression resp. different religions are mentioned (e.g., Hinduism, Christianity)
	Family background	Not represented
		parental income, parental education level, parental social status, and/or parental origin
	Social status	Not represented
		- social status (also pension or social system) of a person/group of people/countries/continents is mentioned - crime status, security status, population structure, political situation, unemployment rate, and/or the social structure of countries or continents are named
	Family status	Not represented

		- family planning, formation, or founding is written about - one-child policy (as a reference to marital status) - family planning is mentioned in connection with other dimensions - children are mentioned in the context of family (without describing more concrete tasks/meanings of children)
	Age	Not represented
		- naming or describing certain age groups (also in the form of children, adults, and seniors) and possibly accompanying internal differentiation - indications that suggest ages are named: being young/old

2.3.4 Anchor examples

In this section, representative anchor examples are given for selected categories to demonstrate the coding framework. In addition, anchor examples are provided that show the salience of multiple dimensions interwoven within one context.

2.3.4.1 Race

One example of the representation of race in the analyzed textbooks is shown below:

"One in four blacks, one in six Hispanics, and one in thirteen whites live in severe poverty in the U.S. (2015). In U.S. metropolitan areas, this number shifts even further to the disadvantage of minorities. The inner city of Chicago currently experiences the most ethnic and social segregation nationwide" (Diercke).

Furthermore, additional dimensions are addressed in the context of *race* (skin color), namely *ethnicity*, and through statements regarding social status.

"Even though slavery had been abolished in 1865, blacks in particular, as the largest minority, remained disadvantaged in daily life. Their wages were lower, they were often denied the right to vote, and advancement through school and college was not affordable" (Terra 2 – grades 7–8).

2.3.4.2 National origin and economic status

There are also examples of contrasting juxtapositions of "us" in Europe, and especially "we" in Germany, versus "them"/the others. This anchor example shows the representation of the dimension *national origin* combined with that of *economic status*.

"The injustice in the world, expressed in the growing gap between a 'society in abundance' and a 'society in poverty', calls for action - and not only from a moral point of view. Too little do we here in the 'rich North' seem to be aware that the problems in the 'poor South' are also our problems" (Fundamente, p. 306).

2.3.4.3 Gender

The following is one of many examples representing the depiction of females in the textbooks studied:

"Favelas applying to a place of violence and crime. But cleaning ladies and factory workers, janitors and cabdrivers, and sometimes teachers and architects, also live there" (Sedylitz 2).

In addition, the category *gender* was often depicted conspicuously within the topic area *Globalization and the fragmented world* (n = 21/41), as reflected in the examples below:

"While equality in our country, however, is more a question of the equality of men and women, in developing countries it is a question of the fundamental recognition of women as social beings, sometimes even as 'human beings' (FUNDAMENTE, p. 310) or, similarly, taken from the Diercke textbook (p. 417), *"There is also a gender problem in industrialized countries. But while there it is rather about a general equality of man and woman, in developing countries it is about the basic acceptance of the woman as a social and often even as a human being."*

2.3.4.4 Disability

Two main options exist for coding *disability*. Coding can be assigned to disability a) in the form of diseases (AIDS) or b) as a result of environmental disasters, based on which long-term damage often follows.

a) *"While in the countries of the North prosperity-related circulatory diseases and cancer are the most frequent causes of death with 47% and 22%, in the countries of the South the so-called 'diseases of poverty' predominate, especially infectious and parasitic diseases, e.g. diarrheal diseases, tuberculosis, malaria, cholera and above all AIDS"* (Fundamente – grades 11–13).

b) *"The Jabotabek region, formed by Jakarta, Bagor, Tangeray and Bekasi, the three cities surrounding the capital, is one of the largest global densely populated areas, with an estimated population of 20 million. However, the hopes of immigrants are often disappointed. Instead of social advancement and wealth, the reality is usually life in slums with unemployment, lack of social security, poor sanitation, patchy utilities and waste disposal, and high environmental pollution"* (Mensch & Raum – grades 11–13).

2.3.4.5 Several dimensions within one context

Overall, it is noticeable that several of the dimensions often occur together (n = 431 > 1 vs. 341 = 1), such as in the following anchor example that encompasses the categories of *family background*, *social status*, *national origin*, *educational background*, and *economic status*:

(Berlin): *"The increasing polarization into poor and rich population strata leads to the fact that the urban society differentiates itself socio-spatially to an ever-greater extent: On the one hand, urban neighborhoods are emerging in which social problems are accumulating, such as: Unemployment, poverty, lack of education, a high proportion of foreigners and immigrants, poor housing conditions and a high crime rate. This is contrasted with neighborhoods where affluent population with high purchasing power is concentrated"* (Mensch & Raum).

2.3.5 Quantitative analysis

The content analysis results were analyzed quantitatively to answer research questions 1–4. The number of codes per category was counted to determine the occurrence by category (RQ1), and each coding unit could be assigned to multiple categories. The total number of coding units was 4689.

The categories in the coding framework were derived from our diversity model (see Chapter 2.1, Fig. 2.1). Thus, each category belonged to the internal or external dimensions of diversity. We used this classification to evaluate the relationship between the internal and external dimensions regarding their representation in geography textbooks (RQ2). In total, seven categories were classified as internal, and six categories as external. We counted the total number of codes for each category and normalized the occurrences to the number of categories.

The relationship between the representation of diversity and the grade (RQ3) needs to take into consideration the target group of each textbook. Each textbook is written for specific grades (see Tab. 2.1). We used this information to calculate the ratio of the total occurrence to the occurrence of each category by grade. Therefore, we normalized the occurrences in each grade to their coding units.

Regarding the relationship between the representation of diversity and the topic (RQ4), the coding units were assigned to the geographic subfields by referring to the textbooks' chapters. Specifically, we assigned each textbook chapter to one of the eight subfields. The occurrences were normalized to the coding units of each subfield (see Tab. 2.4).

2.4 Results

We will now present the results of the quantitative analysis followed by the qualitative results.

2.4.1 Occurrence frequencies for each dimension

First, the textbooks were examined for occurrences of the 13 dimensions. The highest occurrence relates to the *economic status* category (n = 485), followed by a large gap to the next highest category of *social status* (n = 203). *Race* is the least represented category (n = 16) (s. Tab. 2.5). All the other categories are widely distributed in terms of their occurrences. Fig. 2.2 shows the relative occurrence of each dimension.

Table 2.5: Absolute quantities of all the dimensions in the geography textbooks.

Dimension	**Race**	**Gender**	**Sex**	**Ethnicity**	**National Origin**	**Age**	**Disability**
Abs. occurrence	16	41	32	94	193	126	61
Dimension	**Religion**	**Economic Status**	**Educational Background**	**Social Status**	**Family Background**	**Family Status**	**Family status**
Abs. occurrence	27	485	164	205	50	50	46

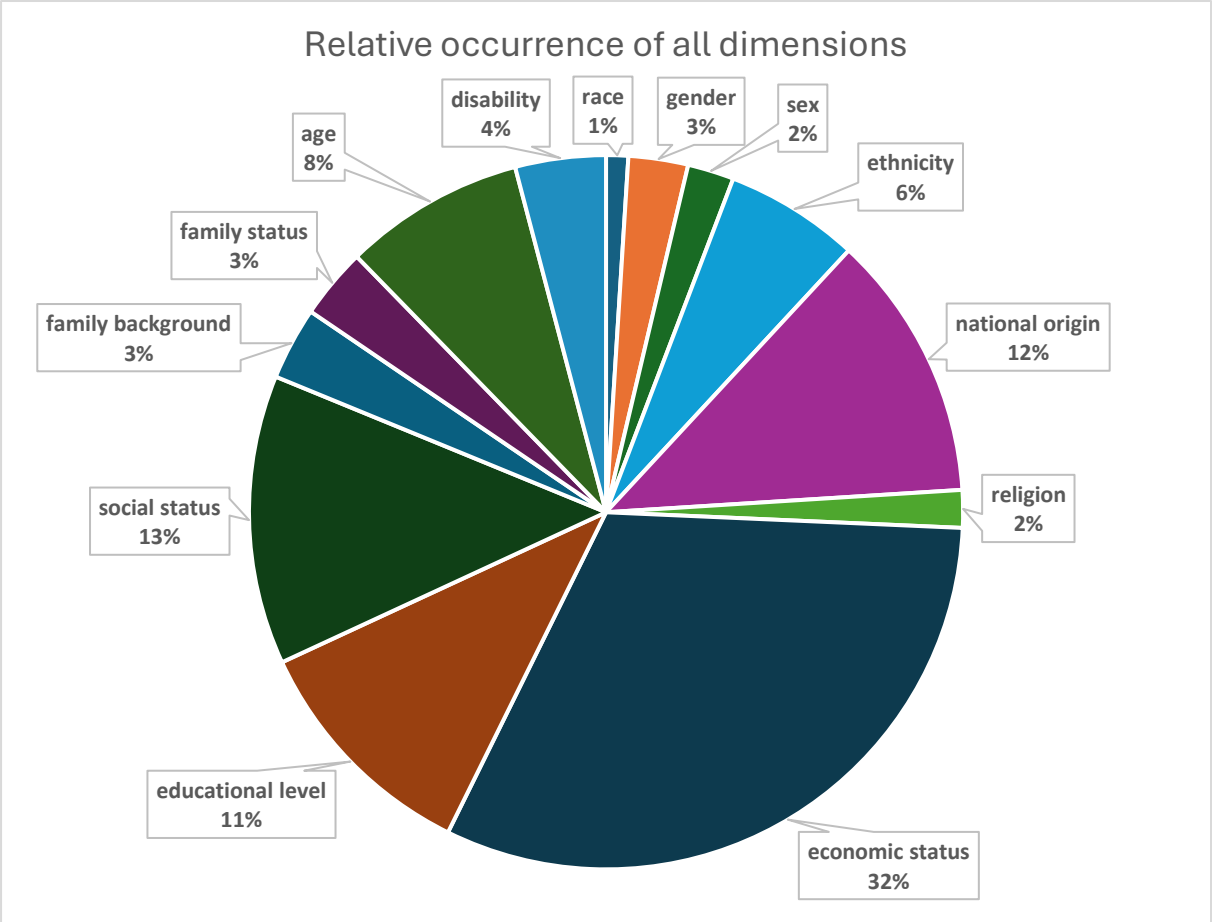

Figure 2.2: Relative quantities of all the dimensions in the geography textbooks.

2.4.2 Dimensions classified as internal and external

The analysis of the internal and external diversity dimensions gave the following results: The number of external dimensions (abs. = 977) is almost twice as high as the occurrence of internal diversity dimensions (factor: 1.7) (see Fig. 2.3). Since the number of internal dimensions (7) is higher than the number of external dimensions (6), the

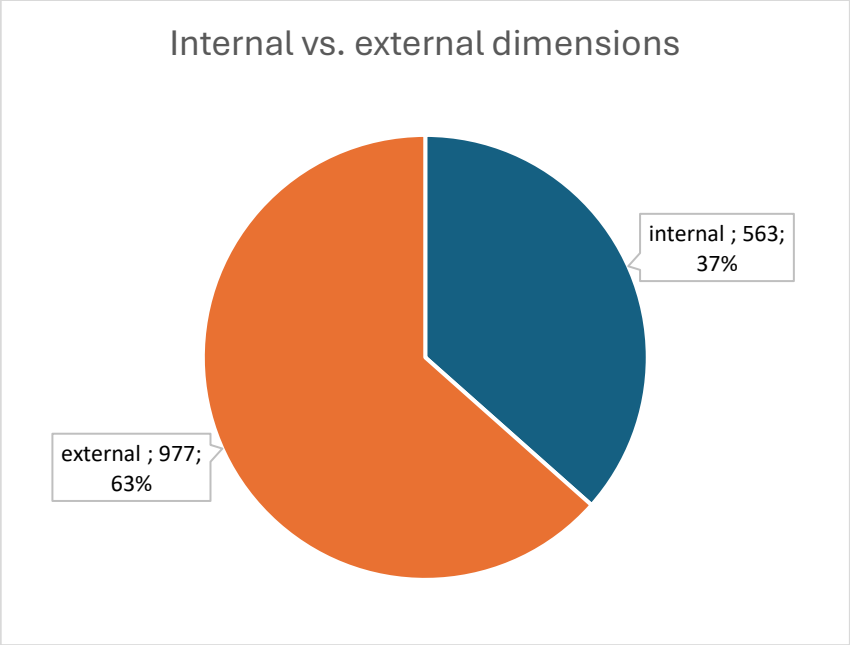

Figure 2.3: Internal vs. external dimensions.

relative occurrence of the external dimensions is even higher (factor: 2.0). The dimensions with the highest overall absolute occurrences (*economic status* and *educational background*) are external diversity dimensions and account for a relative share of over 50%.

2.4.3 Relationship between the represented diversity and the grade

Table 2.6: Correlation between the internal and external dimensions and the grade.

	Grades 5–6	**Grades 7–8**	**Grades 11–13**	**Total**
Abs. occurrence	74	323	1144	1541
Coding units	558	557	3573	4689
Occurrence per 100 units	13	58	31	103
Standardized share of codes (%)	13	57	30	100

Next, the relationship between the diversity dimensions and the grade is presented by standardizing the occurrences based on the coding units of each textbook. A key result reveals a meager share of the total representation of diversity (13%) in the lower grades (grades 5–6) (see Tab. 2.6). More than double this (about 30%) is found in the upper grades (10–13) and the majority (57%) were observed in the middle grades (grades 7–8).

2.4.4 Relationship between the represented dimensions and topics

The following passage presents the correlation between the diversity dimensions and topics. After standardizing the absolute results related to the coding units of each subfield, the relative occurrences reveal the following results: Depending on the coding units, most of the codes are found within the topic area of *population* (38%), followed by the subfields of *globalization and the fragmented world* (18%), *countries and continents* (13%), and *urban and rural spaces* (11%) (see Fig. 2.4). *Tourism*, *economics*, and *resources* (8%, 6%, and 5%, respectively) each contains a medium share of the codes. The lowest relative share is assigned to the topic area *earth* (1%) (see Fig. 2.4). Overall, it is noticeable that the dimensions of *race*, *gender*, *ethnicity*, *national origin*, *economic status*, *family background*, *social status*, and *disability* are each shown to have a high occurrence in one of the eight specific subfields. For illustrative reasons, the results of each relative occurrence were multiplied by 100.

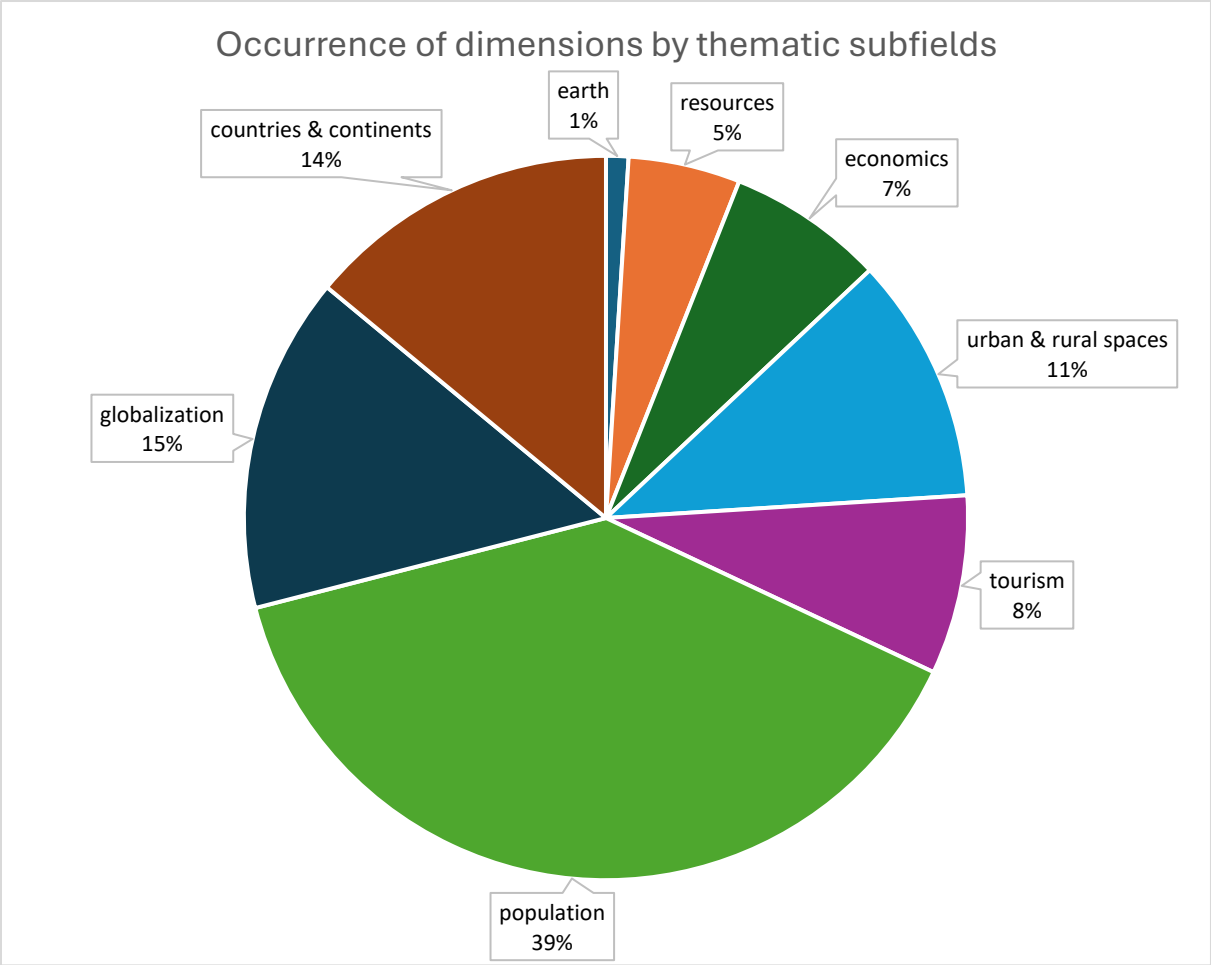

Figure 2.4: Standardized occurrences of the dimensions per subfield.

Table 2.7: Occurrences of each dimension in the thematic subfields – standardized by coding units (in %).

Subfields/ dimensions	**Planet earth**	**Re-sources**	**Eco-nomy**	**Urban & rural spaces**	**Tour-ism**	**Popu-lation**	**Globali-zation**	**Countries & continents**
Race	0	0	0	17	0	24	12	47
Gender	0	0	10	0	13	36	28	13
Sex	0	8	4	7	0	61	11	9
Ethnicity	5	7	7	25	6	3	13	18
National origin	1	2	8	8	3	58	8	12
Religion	3	11	3	32	0	18	2	31

Economic status	1	7	9	11	11	22	23	16
Educational background	0	1	10	9	10	40	17	13
Social status	0	6	7	17	7	33	16	14
Family background	2	2	9	15	9	46	12	5
Family status	0	0	2	8	7	66	6	11
Age	0	2	3	9	16	54	10	6
Disability	5	21	11	0	0	29	26	8

Table 2.8: Proportion of coding units and thematic subfields in each grade range.

	Grades 5–6	**Grades 7–8**	**Grades 11–13**
Number of coding units in subfields 1–3	241	300	1921
Number of coding units in subfields 4–8	314	266	1662

Due to the fact that the textbooks are positioned with regard to curricula and, therefore, specific subfields, the relationship between the coding units and each thematic subfield was related to each textbook. As the relationship between the dimensions and subfields shows, the *planet earth, resources,* and *economy* subfields have the lowest occurrences of the dimensions. All the others contain higher occurrences of the dimensions. Tab. 2.8 shows the proportions of the lower (subfields 1–3) and higher (4–8) occurrences of the dimensions in each textbook. This enables one to see whether the different thematic orientations of textbooks related to their grades are related to the varying occurrences of the dimensions in the textbooks of different grades in general.

2.5 Discussion

Concerning the overall research goal of investigating diversity dimensions in geography textbooks, it can be stated that diversity is represented in the textbooks analyzed (see Tab. 2.5). However, the mean variation in the results regarding the overall frequencies of occurrence is very high. The dimensions with the highest representation are *economic status* (32%), *social status* (13%), *national origin* (12%), and *educational background* (11%). However, it appears striking that *economic status* is coded more

than twice as often as *social status*, because *social status* and *economic status* are two equally important sustainability dimensions and, thus, of particular importance to the subject geography (DGfG, 2020; Hessian Curricula, 2021; 2022). Of the dimensions, 7 have a share of under 5%. For example, disability (4 %) and gender (3 %) are strongly underrepresented, confirming results from Spanish and German textbooks concerning disability (Heinemann, 2020; González-Palomares & Rey-Cao, 2022), as well as Ugandan and American textbooks concerning gender (Barton & Sakwa, 2012; Lucy et al., 2020). In most codings, disability is related to natural events or natural disasters that result in certain people suffering from hunger, etc. Furthermore, the results of this study provide occurrences of role attributions in which women are ascribed to certain work areas and functions, as already noted by Lucy et al. (2020). Race experiences the lowest representation (1%), which is striking evidence of its underrepresentation and makes a one-sided consideration (Grabbert, 2010) probable.

The high difference in the representation of internal and external dimensions (abs. = 585 to 993) does not indicate an interplay of internal and external dimensions and more precisely it argues for an arbitrary illustration of diversity dimensions. These results are also astonishing against the background of the model of diversity (Fig 2.1) based on theory (Gardenswartz & Rowe, 2003) and the adoption by Vertovec 2021 that no category is bounded, but there is a confluence of all several categories. Even the curricula include the requirements of an equal representation of economic and social geographic aspects (as external dimensions) and cultural diversity (as an internal dimension) (Hesse curricula, 2021; 2022). The limited illustration of internal dimensions, in general, contradicts the Federal Commissioner for Migration, Refugees, and Integration's (2015) demand for a realistic portrayal of the diversity among pupils, as well as for its importance to be highlighted by various national and international legalities (e.g., UNESCO, 2017, 2023; European Union Agency for Fundamental Rights, 2019; Council of the European Union, 2000; Federal Office of Justice, 2006). This finding is also interesting against the background of the subject requirements for geography in school and points to the need for a way of representing countries and continents that replaces the current stereotypical representation.

Due to the curricular requirements for the subject of geography, the results regarding the occurrences of the dimensions in grades 5–6, 7–8, and 11–13 are conspicuous. The separation of the curricula in grades 5–9 and 11–13 did not reveal any different claims about the handling of diversity in terms of content. Both curricula address the aspect of (cultural) diversity and call for an open-minded attitude on the part of the students: "The learners (…) grasp social reality in its diversity" (Hessian curricula grades 5–9, 2021, p. 5) or "meet people from different socio-cultural contexts and cultures without prejudice and with reflection in their actions" to acquire intercultural competence (Hessian curricula grades 11–13, 2021, p. 9). The requirements with regard to diversity do not match the wide difference in terms of the occurrences of the dimensions in each grade. Furthermore, it is very dubious

that grades 7–8 have the highest representation of diversity of all the grades when they follow the same curricula as grades 5–6. The further analysis of the subfields that are represented in each textbook as a reason behind the varying occurrences of the dimensions in grades 5–6, 7–8, and 11–13 does not reveal a match. The number of coding units of the subfields with the most represented dimensions (4–8) in grades 5–6 is the highest of all the grades and, simultaneously, of the grade with the lowest occurrence of all the dimensions in general. Therefore, the division of the subfields in the lower grades (5–8) has no influence on the occurrence of the dimensions. This supports the conclusion regarding a non-examination of represented diversity in textbooks by the Hessian Ministry of Education. This result is very interesting because, so far, no studies have pointed out a correlation between the grade and the representation of diversity (e.g., Zhang et al., 2022; Davidson & Liu, 2020; Araújo & Rodríguez Maeso, 2012).

Another striking feature is that the highest incidence of the *economic status* category is not to be found for the most part in the *economy* subject area, but rather, is coded more frequently in three other subject areas (cf. Tab. 2.8): *countries and continents*, *globalization and the fragmented world*, and *urban and rural spaces*. These results suggest that the illustration of diversity dimensions strongly depends on the subject areas of the textbooks. This corresponds with the results of other studies that found that (socio-)economic status is related to academic achievement and family resources as well as educational issues etc. (Reardon et al., 2013; Brown et al., 2016; Morgan et al., 2009). This affects whole societies (American Psychological Association, 2017).

The results may indicate that, despite demands, the representation of diversity in textbooks is not being examined by the Ministry of Education. This is supported by the varied results in terms of the frequencies of occurrence, both in general (RQ1) and specifically within the contexts of the internal and external dimensions (RQ2), the grades (RQ3), and the thematic subfields (RQ4).

2.6 Conclusion

The requirements of the current diversity discourse concerning an adequate representation of the reality of students' lives in a contemporary globalized world cannot currently be sufficiently found in Hessian geography textbooks. The postulated surplus profit of diversity (Gay, 2010; Wearmoth, 2017; Dhungana 2020) remains absent, also in educational settings, due to the result of a unidirectional representation of individuals, population groups, countries, and continents. The problems and consequences related to such diversity representation in geography textbooks are reinforced primarily by subject requirements, especially with regard to the promotion of cultural diversity (DGfG 2020; IGU.CGE, 2018). The mainstream culture, which Civitillo et al. (2019) already identified in German textbooks in general, is also reflected in the current licensed geography textbooks of Hesse, thus

promoting not least a Eurocentrism (Aráujo & Rodríguez Maeso, 2012) and the reinforcement of concepts of the enemy (Mönter & Schiffer-Nasserie, 2007). However, since textbooks can figure prominently in shaping certain social groups, stereotyping is thereby reinforced rather than reduced. The current representation of diversity in the analyzed textbooks is even more questionable.

Last but not least, it should be mentioned that in the analysis of the results, certain patterns could be identified, which can point to conclusions regarding inferences about the different dimensions and their occurrences in particular, as well as a very unidirectional use of different spatial examples, especially regarding countries and continents. Based on this study, it seems necessary to proof German geography textbooks for the representation of diversity with regard to curricular requirements as an implication of this research. This is particularly important against the admission procedure we have in Germany. Further, it is needed to analyze how room samples as countries and continents are represented in context of diversity dimensions, which should be focus on next research processes.

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3 Diversity unveiled – A critical analysis of geography textbooks and their global representation

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Abstract

Educational frameworks emphasize to students the importance of gaining differentiated worldviews and being open-minded toward other cultures. As a primary medium in class, textbooks should accurately represent diversity to help students develop intercultural awareness and critical thinking. This study aims to analyze geography textbooks' representation of diversity dimensions across different countries and continents using a multidimensional approach to superdiversity. For the analysis, a qualitative content analysis is initially conducted. Then, the representation of the continents is compared using network analysis. Our findings reveal a biased portrayal across all continents, leading to homogenization within the teaching material. This inconsistency contradicts the curricular requirements of Hessian geography and suggests that the textbook approval process is not sufficiently rigorous in ensuring that the standards are met.

Keywords: Diversity; textbook analysis; qualitative content analysis; network analysis; bias; homogenization

3.1 Introduction

Globalization, migration, and various social movements bring a high degree of diversity into society (Vertovec, 2007), including schools. In Germany, 33% of students have a migration background (Federal Statistic Office, 2023), leading to high cultural, ethnic, and socioeconomic diversity in the classroom (Stoicovy, 2002). An understanding of diversity can only be established and promoted if teaching materials, appropriately depict diversity (Federal Government Commissioner for Migration,

Refugees and Integration, 2015). The United Nations Educational, Scientific, and Cultural Organization (UNESCO, 2017) emphasizes the importance of representing diverse identities in teaching materials, recognizing that there is greater diversity of identities today than ever before due to increased mobility and globalization. Teaching material can enhance students' awareness of diversity and various sources of cultural identity (Tabatadze, 2015; Tabatadze et al., 2020). Therefore, it is crucial that educational materials accurately reflect the multifaceted identities present within and across societies (UNESCO, 2017). In Germany, textbooks are one of the most commonly used medium in geography classes (Brucker, 2017). They are essential for building students' knowledge, values, behaviors, and attitudes (Lee, 2018; Tabatadze & Gorgadze, 2023). Therefore, textbook authors should strive to provide fair and inclusive representations, offering diverse role models and challenging traditional gender norms to broaden students' perspectives and opportunities (UNESCO, 2017).

A reasoned representation is crucial because textbooks are never impartial regarding cultures and ethnicities; their content is often debated and reflects the power imbalances and entrenched beliefs of the dominant culture (Moreau, 2003). Textbooks often idealize one nation while misrepresenting others, hindering social cohesion, appreciation of diversity, and tolerance (Greaney, 2006). Consequently, textbooks communicate socially and culturally endorsed norms, shaping students' perceptions of individuals and ethnic groups different from their own (Cornbleth, 2002; Greaney, 2006). This can result in students internalizing stereotypes, which influences their perceptions of gender, culture, and ethnicity (Izzuddin et al., 2021). Studies of school textbooks, such as the comprehensive study under the auspices of the Federal Government Commissioner for Migration, Refugees, Integration (2015), revealed a significant lack of normalization of diversity and migration across various history, politics, and geography textbooks.

Geography education plays a crucial role in developing a diverse worldview. A socially critical geography curriculum (Fien, 1999) enables students to appreciate the diversity of people and society and the cultural abundance of humanity (International Geographical Union, 1992). To achieve this goal, critical thinking is crucial (Inoue, 2005). According to Critical Multicultural Education (CMCE), critical thinking is promoted by "deeper questions" concerning different cultural perspectives, equality, power relations, and the representation of various groups (Jenks et al., 2001; Sleeter & Grant, 2007). These abilities of changing perspectives and critical thinking are for preventing stereotypes that can lead students to develop biased worldviews (Usher, 2023). CMCE specifically addresses geography's relevance achieving these goals (Picton, 2008; Usher, 2023). Geography textbooks should promote intercultural and critical thinking (Canale, 2016; Davidson & Liu, 2020). Therefore, avoiding stereotypes and biases and addressing diversity are crucial when writing and establishing geographical textbooks (Lee et al., 2021). To global diversity, accurate representation of countries and continents in geographical content is crucial. However, the representation of countries and continents in textbooks

varies significantly (Castro Agudo, 2021; Risager, 2021; Tajeddin & Pakzadian, 2020) and, textbooks do not seem to favor critical thinking and reflection (Canale, 2016).

Education serving a multicultural perspective calls for comprehensive and unbiased representation of continents. Thus, this study aimed to analyze how the representation of countries and continents differs and which patterns of similarities among continents are produced.

3.2 Theoretical framework

3.2.1 Textbook analysis on representation of countries and continents

We identified three research approaches for the representation of countries and continents in textbooks: (1) the overall share of countries and continents' representation, (2) the representation of a specific continent in detail, and (3) the representation of specific diversity dimensions in textbooks.

Focusing on the overall share, Risager (2021) analyzed the general image of the world and the represented range of countries and their image by analyzing all mentioned countries in the analyzed textbooks. The range is mainly wide, however, the UK, US, Canada, Ireland, Australia, and South Africa, are the most represented in textbooks, which is a clear focus on the Western world (Risager, 2021). The over-representation of the UK and the US is supported by several other analyses of different countries in, for example, Turkish (Toprak & Aksoyalp, 2015), American (Hong, 2009), Norwegian (Lund, 2007), and Saudi (Alsaif, 2016) textbooks. There are several critiques on the contribution of represented countries in textbooks; for example, the predominance of Western culture, but not the student's own culture, in Saudi English textbooks used in universities (Alsaif, 2016).

Studies focusing on specific continents revealed that Africa is frequently represented in the context of negative aspects, often reduced to diseases and social problems (Hummer, 2014). Such portrayals tend to perpetuate postcolonial representations of Black people, including racism, prejudice (Aping et al., 2022; Hummer, 2014; Marmer, 2017), and Afro-pessimism (Gordon et al., 2018). Furthermore, Africa is mostly represented as a continent rather than as individual African countries, leading to homogenization and inadequate representation of the continent (Aping et al., 2022). In the context of South America, an analysis of German Spanish textbooks showed that South American children are mainly represented as poor, in need of help, underdeveloped, and problematic (Zabel 2022). In contrast, European society is illustrated as the "white rescuer"—progressive and helpful, reflecting a Eurocentric perspective (Tastan et al., 2016; Zabel, 2022). Many textbook analyses identified an under-representation of several African and Asian countries and an overrepresentation of the US, UK, Canada, Australia, and New Zealand (Castro Agudo, 2021; Lu et al., 2022; Xiang & Yenika-Agbaw, 2021). The homogenization of Asia is found in American textbooks (Hong, 2009), as the representation depends on the political and cultural importance of Asian countries to the US. Thus, Asia is mainly represented by China and Japan because of their economic importance to the US (Hong,

2009), leading to bias in American textbooks. The representation of countries and generated bias leads to a lack of global diversity and absence of local cultures (Gómez Rodríguez, 2015).

In the textbook analysis of English as a foreign language used in China, Xiang and Yenika-Agbaw (2021) explored issues related to race/ ethnicity, gender/ sexuality, social class, and disability. The analyzed textbooks taught the learners that each country has one racial/ ethnic group, representing them. For example, Han represents China, and whites represent the US, UK, and Canada (Xiang & Yenika-Agbaw, 2021).

Textbooks thus limit the opportunity to expose learners to the diversity of the world, which also refers to socioeconomic status. They predominantly depict middle-class individuals as dominating the world and global representations, and the illustrations mostly feature affluent people, while those from lower socioeconomic backgrounds are notably absent (Xiang & Yenika-Agbaw, 2021). In terms of gender and sex, the study found that only males and females are represented, with males significantly over-represented. People with disabilities are completely excluded from these representations (Xiang & Yenika-Agbaw, 2021). An arbitrary representation of 13 diversity dimensions was found by Dörfel et al. (2023) in Hessian geography textbooks. The analyzed 13 dimensions were extremely unevenly represented in their occurrence.

Overall, the existing research primarily focuses on the detailed representation of specific continents or countries, the overall share in a country or continent's representation, or an analysis of cultural diversity dimensions. A comparison of the country's and continent's representation from a multidimensional perspective will help to bridge these different approaches.

3.2.2 Curricular requirements

In general, the Hessian curriculum demands students to gain a multidimensional and differentiated worldview, be open-minded toward other cultures, and depict the social reality of diversity (Hessian Curricula, 2021). The Hessian curriculum highlights the importance of critical thinking (including the context of culture), reflective engagement with facts, and geographic issues. These elements are required in both the lower (grades 5–9) and upper (grades 11–13) curricula, as well as in almost all geographical competency and educational standards. Both curricula require students to gain an intercultural understanding resp. competency; for example "meeting people from different sociocultural contexts and cultures without prejudice and with reflection in their actions" (Hessian Curricula, 2023). Geography teaching should, therefore, enable critical thinking in students (Hessian Curricula, 2023; Young & Lambert, 2014), offering significant opportunities for challenging stereotypes (Picton, 2008) and grasping the social reality of diversity (Hessian Curricula, 2021).

3.2.3 Superdiversity in textbook analysis

This study is grounded in the superdiversity approach (Vertovec, 2007). This approach prompts a reassessment of social categories as multidimensional, fluid, and permeable, contrasting with a one-dimensional group perspective (Vertovec, 2007). To address the inherent complexity of modern societies, it is necessary to consider various diversity dimensions simultaneously (Vertovec, 2007). That is, individuals or groups should not only have exemplary French national background but also specific economic status, educational background, and for example a disability. To specify this multidimensional approach, we adapted the classification of diversity dimensions by Gardenswartz and Rowe (2002). They classified diversity of individuals into three layers: (1) the internal dimensions (innate) are most stable; (2) the external dimensions (acquired) are more variable over the lifetime of an individual; and (3) the outermost layer are organizational dimensions. We devided the classification into internal and external dimensions and focused on 13 dimensions to describe the diversity of groups of individuals, such as societies, countries and continents (Dörfel et al., 2023).

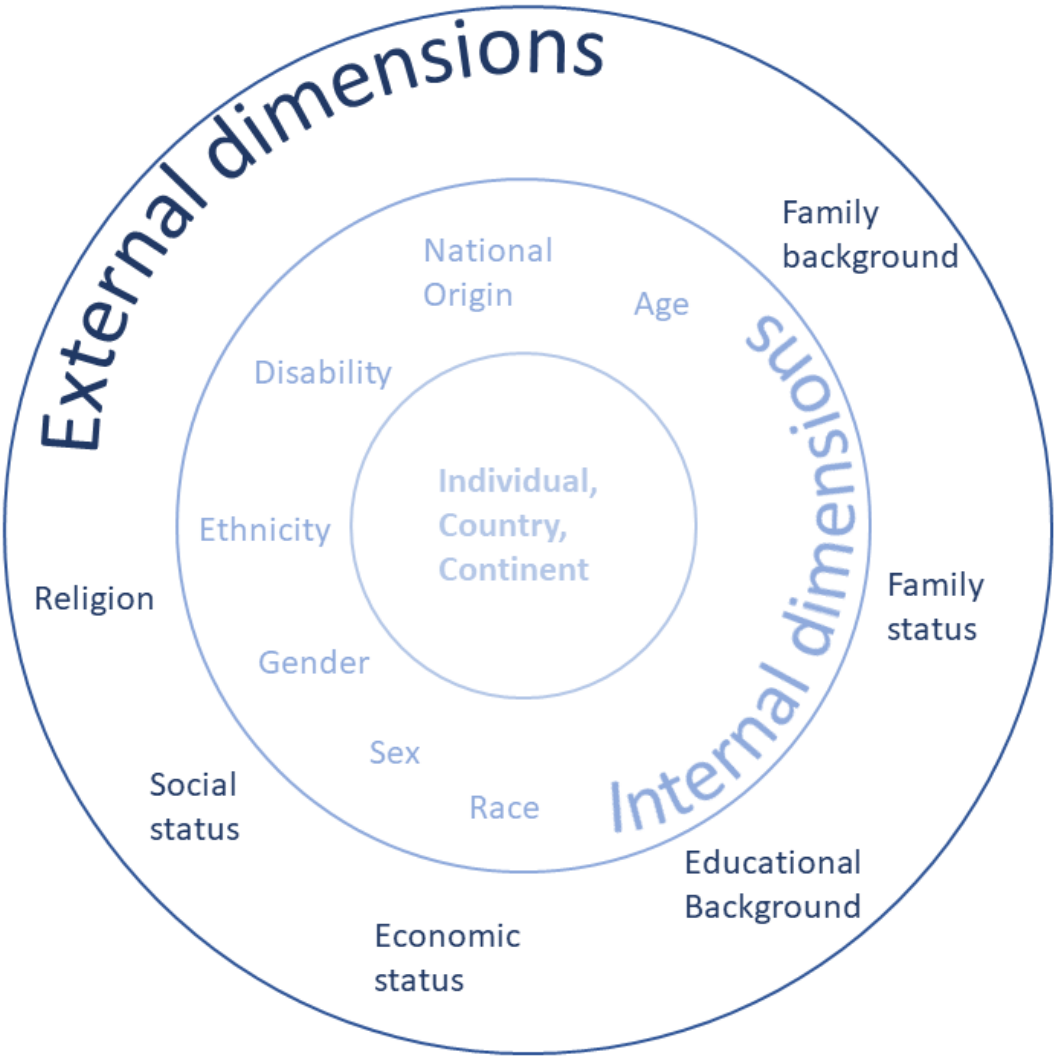


Figure 3.1: Diversity dimensions classified into internal and external dimensions (CC by Dörfel et al., 2023).

Examining the representation of countries and continents in the context of multidimensional diversity in geography textbooks allows us to evaluate two aspects: first, if textbooks avoid stereotypes and homogenization and, second, if they appreciate the diversity of the countries and continents by adequately representing diversity considering multidimensionality. Not considering an adequate representation can lead to consequences such as Eurocentrism (Nagre, 2023; Tastan et al., 2016; Zabel, 2022); othering (Lippert & Mönter, 2021), which means a constructed distinction between "us" and "the others" (Aping et al., 2022); and postcolonial representation of cultures and countries (Hong, 2009; Risager, 2021).

3.2.4 Research aim and research questions (RQs)

The Hessian curriculum demands the development of competencies such as critical thinking, open-

mindedness, and interculturality, as well as avoiding prejudices (Hessian Curricula, 2021; 2023). Considering the concept of superdiversity, diversity dimensions and their interconnection constitute the complex representation of continents. Homogenizing or simplifying diversity dimensions regarding different countries and continents would contradict curricular requirements.

We therefore aim to answer the following RQs:

RQ1: *Does the frequency of diversity dimensions vary across countries and continents in Hessian textbooks?*

RQ2: *Does the connection in which dimensions occur differ between continents in Hessian textbooks?*

3.3 Methods

3.3.1 Sampling

Hesse is one of six federal states with a textbook catalog for lower grades (5–6), middle grades (7–8), and upper grades (10–13) for high school (Gymnasium) (current catalogue from 01.08.2022) (appendix). The Hessian Ministry of Education and Cultural Affairs conducts the admission process. The analysis of all 11 licensed textbooks allows for a verification of the implementation of curricular requirements in representing diversity referring to all grades. The selection is limited to composite media but include all author texts of the 11 textbooks.

3.3.2 Qualitative content analysis

The textbook content was qualitatively examined using category-guided text analysis (Kuckartz & Rädiker, 2022). A category system developed through a deductive-inductive approach was the core of the analysis: 13 categories were initially derived from theoretical frameworks (deductive) and subsequently refined iteratively (inductive) (Kuckartz & Rädiker, 2022). This process resulted in a comprehensive coding framework with specific coding rules for each category or dimensions (Table 1) (Dörfel et al., 2023).

Table 3.1: Coding framework with coding rules for 13 analyzed dimensions (Dörfel et al., 2023).

Main category	**Subcategory**	**Coding rule**
Internal dimensions	Race	Not represented
		- skin color (black/white)

		- nations, which are indirectly related to skin color (e.g., Hispanics, Afro-Americans)
	Gender	Not represented
		- gender-specific role models - responsibilities of men and women
	Sex	Not represented
		- biological sex (female/male) is mentioned or arises in the content
	Ethnicity	Not represented
		- ethnic groups/ethnic minorities - groups are depicted that identify as such based on a common culture and/or language and/or behavior - groups with common ancestry - culture, language, values, and norms or a specific ethnicity are highlighted as a cause of or reason for something - cultural diversity is described
	National origin	Not represented
		- migrants or people with a migration background are picked out - national origins of individuals or groups (e.g., “Germans,” “Indians,” “Canadians”) are named in the context of migration - national origin is used for a comparison (e.g., Chinese and South Africans are different/similar in ...) - countries of origin and destination are mentioned - the flow of refugees is mentioned (e.g., “Due to refugee flows to Germany, ...”) - the juxtaposition of national origins by contrasting them using pronouns such as “we” and “the others”
	Disability	Not represented
		- the terms physical/mental or sensory impairments are mentioned. - social impairments are described in more detail using a specific example (countries and continents) (e.g., famines, epidemics, child mortality, natural disasters)

External dimensions	Economic status	Not represented
		- economic crisis/prosperity - low/high GDP - low/high unemployment - lower/higher developed - low/high standard of living - comparison of different economic statuses
	Educational background	Not represented
		- no/low access to education - lowly educated - undereducated labor force; low educated labor force - access to education - more highly educated - skilled workforce; highly educated workforce
	Religion	Not represented
		- religion mentioned as a term - expression resp. different religions are mentioned (e.g., Hinduism, Christianity)
	Family background	Not represented
		parental income, parental education level, parental social status, and/or parental origin
	Social status	Not represented
		- social status (also pension or social system) of a person/group of people/countries/continents is mentioned - crime status, security status, population structure, political situation, unemployment rate, and/or the social structure of countries or continents are named
	Family status	Not represented
		- family planning, formation, or founding is written about - one-child policy (as a reference to marital status) - family planning is mentioned in connection with other dimensions

		- children are mentioned in the context of family (without describing more concrete tasks/meanings of children)
	Age	Not represented
		- naming or describing certain age groups (also in the form of children, adults, and seniors) and possibly accompanying internal differentiation - indications that suggest ages are named: being young/old

Based on headlines, sub-headings, and paragraphs, we defined coding units to structure the text by self-contained sections for a systematic analysis. We identified a total of 4,689 coding units across all textbooks. Using the coding framework, we categorized each unit according to one or more of the 13 defined categories. Accordingly, a coding unit may fall into no category, a single category, or combination of any of the 13 categories.

Concerning the research aims, the main coding rule for categorizing and assigning one or more categories is the relation to a specific room sample. This includes both countries and whole continents. Cities or specific regions as part of a country (e.g., Ruhrgebiet) were subordinated to the country.

A second coder analyzed 36% of the material (4 out of 11 textbooks), using the coding framework independently and achieved similar results. Using Cohen's (1960) kappa, the intercoder reliability measured was 0.8, which was satisfactory (Greve & Wentura, 1997).

3.3.3 Quantitative analysis (RQ1)

To answer the RQ1, the results of the qualitative content analysis were evaluated quantitatively. Coding rules were used to identify the occurrence of all 13 diversity dimensions related to a country or a continent.

3.3.3.1 Countries

First, if one or more categories in a coding unit are related to at least one country, the occurrence of each representative category is attributed to the mentioned country. If there is more than one country

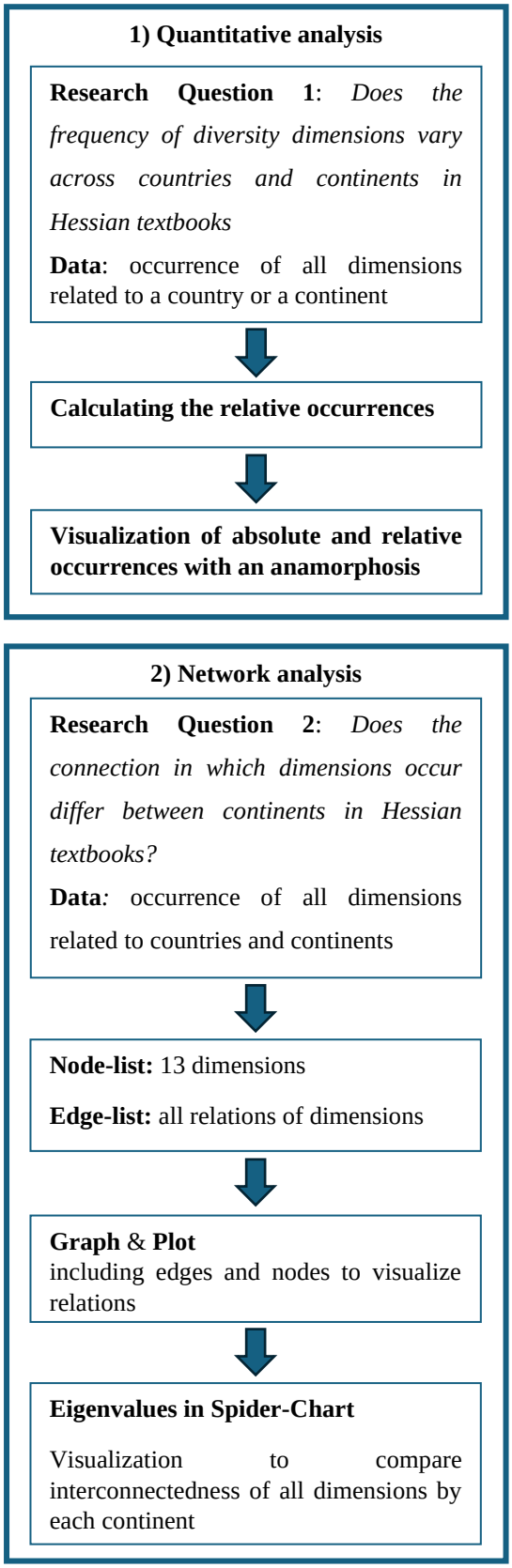


Figure 3.2: Schematic representation of methodological procedure.

as a room sample (e.g., Germany, France, and the UK), the represented dimensions are coded for each of the mentioned countries. Based on this procedure, the absolute occurrence of all diversity dimensions related to countries could be calculated for each country. Adding all absolute occurrences of countries classified into their continents, it was additionally possible to calculate the relative occurrence to evaluate the distribution of all countries of each continent. An anamorphosis visualizes the occurrences of diversity dimensions of all countries based on the absolute occurrences of all countries. The less a country was represented in the context of diversity dimensions, the smaller the country's surface was illustrated, and the higher it was represented, the bigger its surface in the anamorphosis.

3.3.3.2 Continents

We calculated the absolute occurrence of all categories related only by the direct name of a continent (e.g., Africa and Europe) to evaluate how differentiated continents are represented. Based on these absolute occurrences, a second anamorphosis of the world's continents has been created with the same procedure to visualize the results.

3.3.4 Network analysis (RQ2)

The network analysis applied graph theory to gain insight into the structure of a network (Newman et al., 2006). Nodes define the elements of these structures. The links between the elements are edges. In this study, diversity dimensions define the nodes in the network analysis (compare Figure 3.2). The common occurrence of two dimensions in one coding segment defines an edge. For more than two dimensions in a coding segment, the edges are documented in all pairs possible. We used R software (Douglas et al., 2024)

and the *igraph* package (Csárdi et al., 2023) for the analysis. Analyzing the data by continent enables the comparison needed for RQ2. Regarding the occurrence for all dimensions per continent, we added up all codings per country, including the number of codes mentioned for the whole continent, with an exception that multiple answers of countries of the same continent in a single coding unit were only counted once for their continent (e.g., France, Germany, and the UK = 1× for Europe). Multiple countries from different continents in a coding unit were counted once for all different continents. As Oceania had a total occurrence of 13, which is not representative of the analysis, it was not considered for further analysis and discussion. We used two methods to gain insight into the network structure. First, we calculated the eigenvalues (EVs) (Bloch et al., 2023) of each node to concisely describe the position the node holds in the network by EV centrality (EVC). The EVC measures centrality based on the neighbour's connections; a connection to a highly connected neighbor weights more than a loosely connected neighbor (Bloch et al., 2023). We depicted the EVs in spider charts using the R package *fmsb* (Nakazawa, 2023) to compare the EV patterns between the continents. Secondly, we plotted the network graph to depict all nodes and edges coded for each continent. We increased the size of each node by its degree of centrality (Bloch et al., 2023) to visualize the dimension's weight in representing the continent's diversity in the textbook. The Fruchterman-Reingold algorithm positions the nodes in the plot, locating those with many connections close together and those with few more distant.

3.4 Results

This section presents the research finding structured by our RQs.

3.4.1 RQ1

3.4.1.1 By countries:

Three different countries on different continents represent a high occurrence of diversity dimensions: Germany (159), the US (150), and China (124) (Table 3.1). By a considerable margin, India is the fourth most diverse represented country in the textbooks (n=74). Countries missing in Table 3.1 were not mentioned in the context of diversity. There are 47 countries listed in Table 3.1 with an absolute occurrence of five or less, which is, in total, a relative share of 59% of all represented countries in the context of diversity (n [total] = 80).

Table 3.2: Absolute occurrence of all analyzed dimensions related to countries represented in textbooks.

Europe	**Abs. Occ.**	**Asia**	**Abs. Occ.**	**Africa**	**Abs. Occ.**	**North America**	**Abs. occ.**
Germany	159	China	124	Nigeria	19	USA	150
Great Britain	35	India	74	Democratic Rep. Of the Congo	13	Mexico	11
France	31	Vietnam, Singapore	16 ea.	Namibia	11	El Salvador, Guatemala, Honduras	5 ea.
Italy, Poland, Spain	16 ea.	Japan	15	Ethiopia	9	Canada	2
Austria, Greece, Ireland	8 ea.	Russia	13	Somalia	7		
Denmark	7	South Korea	12	Mozambique	6	**South America**	**Abs. occ.**
Hungary, Portugal	6 ea.	Syria	11	Malawi, Eswatini, Tansania	4 ea.	Brazil	24
		Philippines	7			Peru	15
Czech Republic	4	Malaysia	6	Kenya, Marocco, Uganda	3 ea.	Bolivia	5
						Venezuela	4
Norway, Romania	3 ea.	Bangladesh	5	Egypt, Senegal, Sierra Leone, Sudan	2 ea.	Argentina, Chile	3 ea.
						Ecuador	2
Netherlands, Slovakia, Switzerland	2 ea.	Arab. Emirate, Indonesia, Iraq, Turkey	4 ea.	Algeria, Angola, Libya, Mali	1 ea.		
Finland, Latvia	1 ea.	Kuwait, United Arab Emirates, Thailand	3 ea.			**Oceania**	**Abs. occ.**
		Brunei, Mongolia,	2 ea.			Australia	13

		Tajikistan, Taiwan					
		Iran, Israel, Qatar, Pakistan	1 ea.				

Figure 3.3 visualizes the results by illustrating the surface of all countries in proportion to their occurrence of represented diversity dimensions using value ranges.

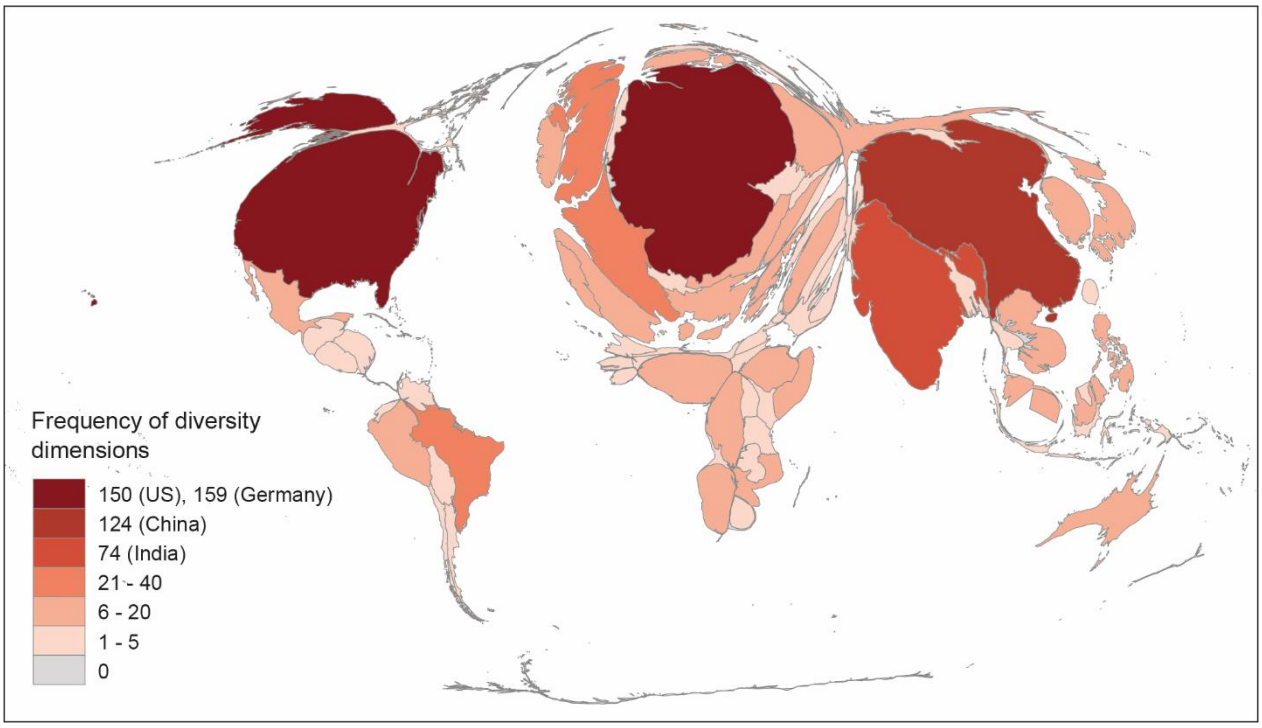


Figure 3.3: Anamorphosis – Illustration of countries by occurrence of diversity dimensions (drafted by Dörfel et al. 2023; illustrated by C. Enderle, 2023)

Looking at the relative occurrences of dimensions according by countries (Table 3.3), it is striking that the diversity dimensions of all continents are dominated by only one or two countries. Europe's diversity representation is dominated by Germany (48%), and is overwhelmingly higher by Western (90%) than Eastern European countries (10%). Asia is represented by China and India (59%), South America by Brazil (44%), and North America by the US (84%). Oceania is represented 100% by Australia. However, it is only mentioned 13 times and, thus, finds little representation overall. The distribution of diversity dimensions in Africa is the most balanced, represented by Nigeria, DR Kongo, and Namibia (45% in total).

Table 3.3: Relative occurrences of all analyzed dimensions related to countries represented in textbooks.

Europe	**%**	**Asia**	**%**	**Africa**	**%**	**North America**	**%**
Germany	48	China	37	Nigeria	20	USA	84
England	10	India	22	Democratic Rep. Of the Congo	14	Mexico	6
France	9	Japan, Singapore, Vietnam	5 ea.	Namibia	11	El Salvador, Guatemala, Honduras	3 ea.
				Ethiopia	9	Canada	1
Italy, Spain, Poland	5	Russia, South Korea	4 ea.	Somalia	7		
Austria, Denmark, Greece, Hungary, Ireland, Portugal	2 ea.	Syria	3	Mozambique	6	**South America**	**%**
		Malaysia, Philippines	2 ea.	Malawi, Eswatini, Tansania	4 ea.	Brazil	44
						Peru	27
						Bolivia	9
Czech Rep., Netherlands, Norway, Romania, Switzerland, Slovakia	1 ea.	United Arab Emirates, Bangladesh, Brunei, Iraq, Kuwait Mongolei, Tajikistan, Taiwan, Thailand, Turkey	1 ea.	Kenya, Marocco, Uganda	3 ea.	Venezuela	7
						Argentina, Chile	5,5 ea.
						Ecuador	2
				Senegal, Sierra Leone	2 ea.		
						Oceania	**%**
Finland, Latvia	0 ea.	Indonesia, Iran, Qatar, Pakistan	0	Algeria, Angola, Libya, Mali	1 ea.	Australia	100

3.4.1.2 By continents:

The absolute occurrences of diversity dimensions shown in Table 3.1 significantly differ from those in the context of entire continent (Table 3.4). The highest occurrence of dimensions in the context of an entire continent is Europe (n=105), followed by Africa (n=76), and the lowest of Oceania (n=5) and Asia (n=13).

Table 3.4: Absolute occurrences of dimensions related to continents.

Europe	**Asia**	**South America**	**Oceania**	**Africa**	**North America**
105	13	25	5	76	24

Figure 3.4 visualizes this representation of diversity dimensions related to continents through an anamorphosis by adapting the continents surface to the representation of diversity.

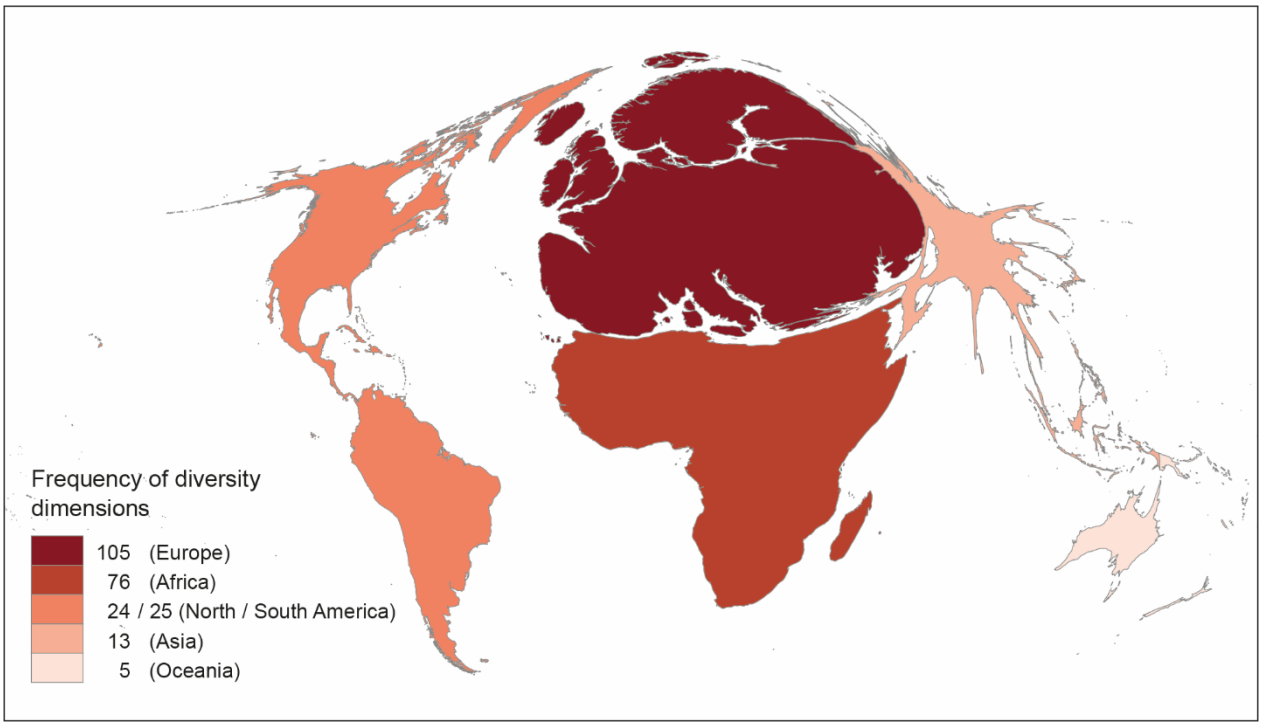


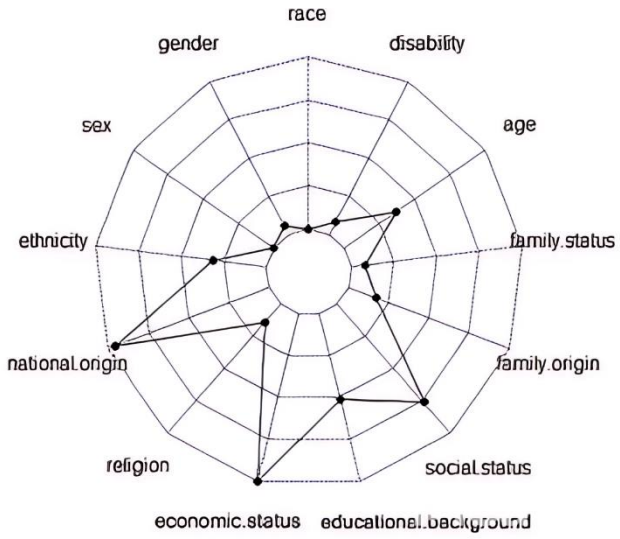
Figure 3.4: Anamorphosis – illustration of continents by occurrence of diversity dimensions (drafted by Dörfel et al. 2023 – illustrated by C. Enderle, 2023).

3.4.2 RQ2

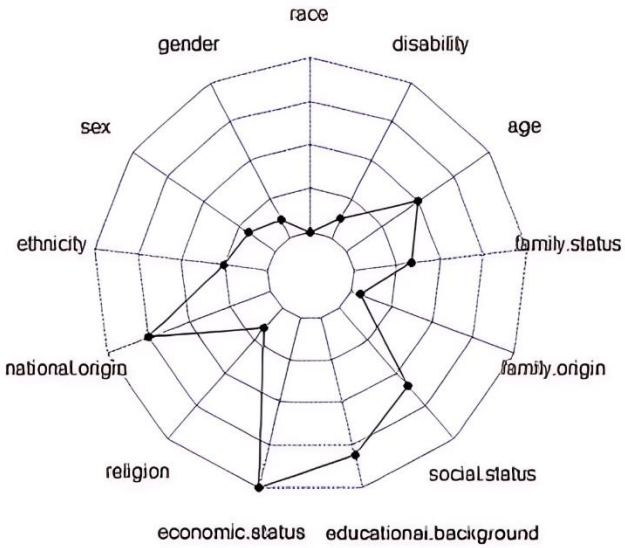
The EVs of the nodes differ between continents (Figure 3.5). For Europe, the most central nodes are economic status, social status, and national origin, similar to North and South America. However, comparing the overall pattern, Europe and Asia are alike; both networks have a high or medium centrality in terms of economic status, social status, national origin, educational background, age, and

ethnicity. The other nodes are not central, except for medium family status in the Asian network. The centrality in the North and South American networks is also alike; while ethnicity is more central here, race is solely central in North America. In the representation of Africa's diversity, economic status is the sole central node. Africa has a distinct pattern; the high economic status is sided by medium values in national origin, educational background, social status, age, and disability. Disability is not central in any network. The only commonality in all continents is that three of the external dimensions (economic status, social status, and educational background) are more central than all internal ones (race, ethnicity, age, gender, sex, and disability), except for the national origin.

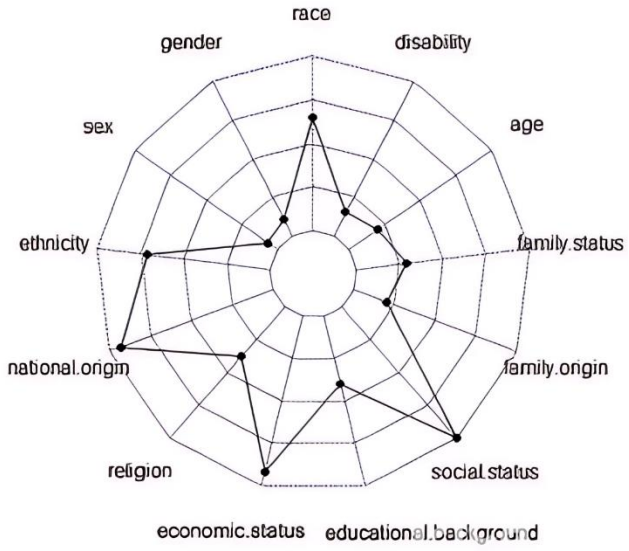
A Europe



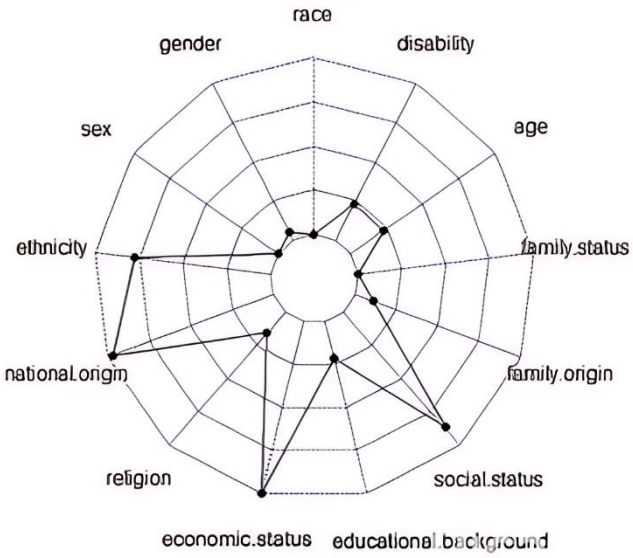
B Asia



C North America



D South America



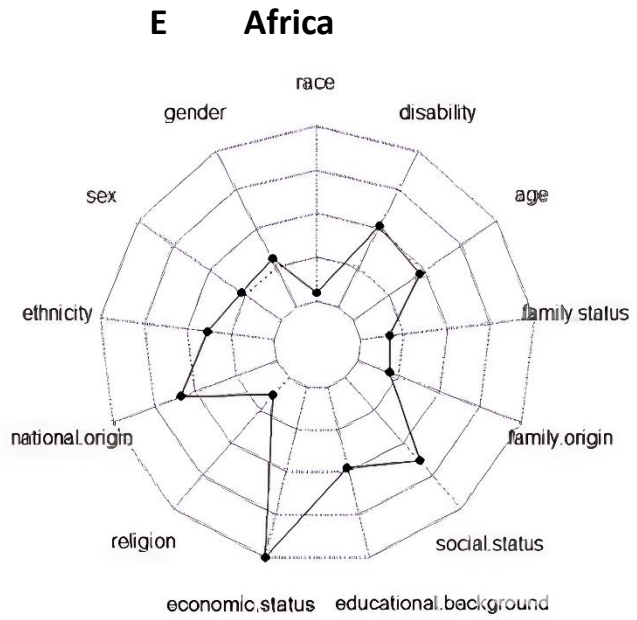


Figure 3.5: (A-E) Spidercharts with eigenvalues of network analysis for all continents.

The network graph of each continent (Figure 3.6 A-E) shows all edges (lines) between the 13 nodes (orange spheres) in the analyzed textbooks:

(1) **Europe** is characterized by high interconnection of the three nodes' economic status, national origin, and social status (Fig. 3.6 A). The orange circles represent the overlapping nodes, illustrating their high degree of centrality and close interconnection. In the second row, educational background, age, and ethnicity are highly connected. The other dimensions are less connected and often occur more isolated (periphery). Sex only occurs isolated in one code, and race does not occur in the context of Europe at all.

(2) **Asia** is characterized by five central nodes (economic status, social status, educational background supplemented by national origin, and age), all of which are well interconnected, with economic status located in the middle (Fig. 3.6 B). Family status and ethnicity are well connected to this core unit. Sex, gender, disability, religion, and family origin are loosely connected to the network in the periphery. Race occurs only in isolation.

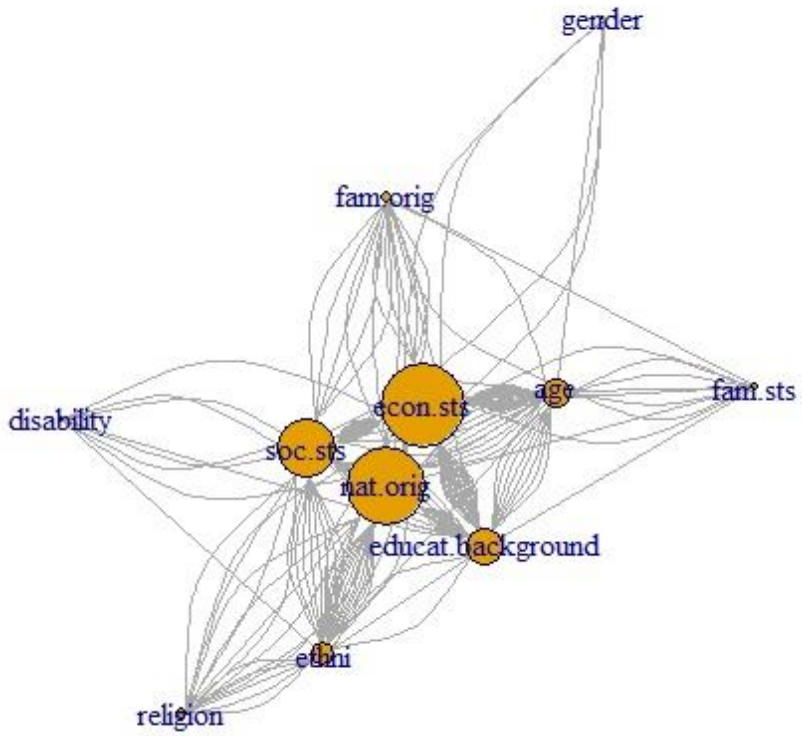
(3) In the representation of **Africa**'s diversity, economic status is the most central node, which is connected to almost all other nodes. Social status, national origin, educational background, ethnicity, age, and disability constitute a circle around it (Fig. 3.6 C). Sex, gender, family origin, religion, family status, and race are outwards. Race is the most distant node.

(4) The **North American** network is characterized by a core unit of closely connected nodes' national origin, social status, and ethnicity (Fig. 3.6 D). Race, also of medium-high centrality, is more distant, apparently lacking a close connection to national origin. Religion, family

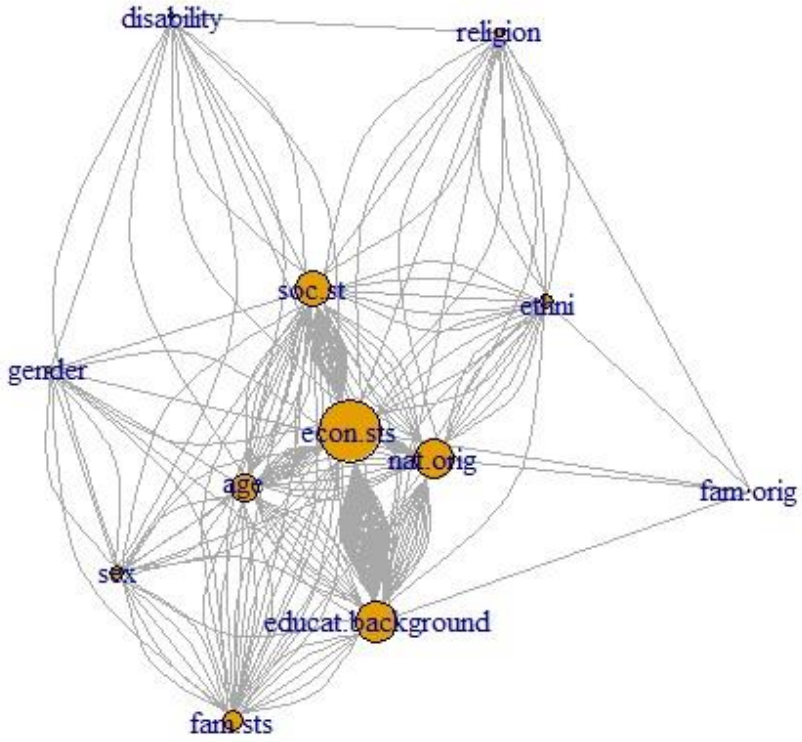
status, family origin, and educational background constitute a close part of a half circle, and age, disability, gender, and sex are a more distant part of a half circle around this core unit. Sex is the node with the closest connection to the network.

(5) The core of the **South American** network can be described as a chain (Fig. 3.6 E). Ethnicity, national origin, economic status, and social status are only closely connected to the neighbors in this row but lack interconnectivity between them. Disability, age, educational background, gender, family origin, and religion are loosely connected to this core. Among the outer nodes, only disability and age have an edge. Race, sex, and family status find no mention in the context of South America. An essential difference between the North and South American networks is the generally higher occurrence of all dimensions in North America, resulting in more edges.

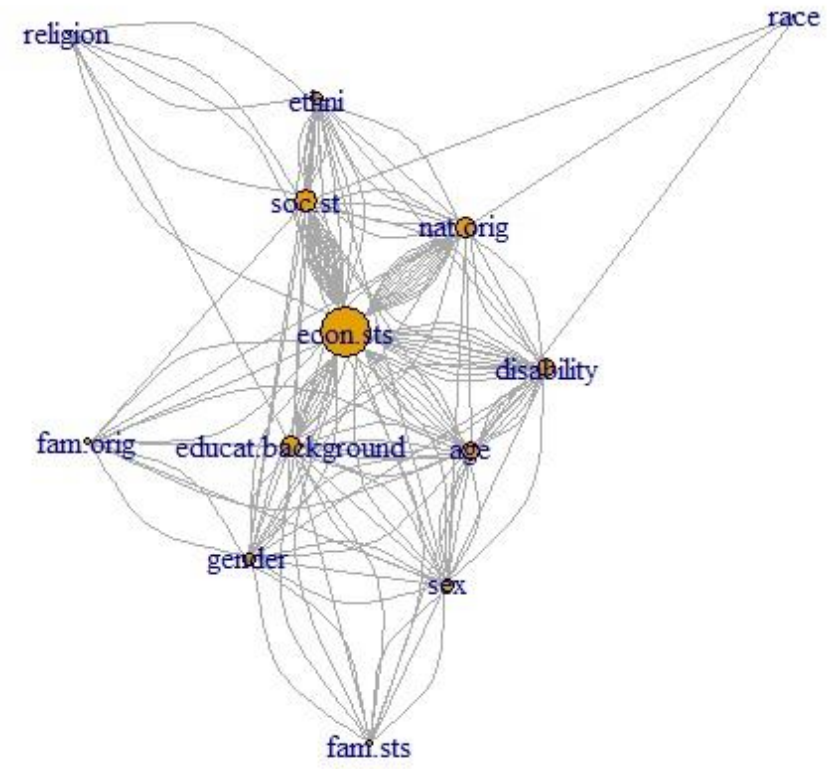
A Europe



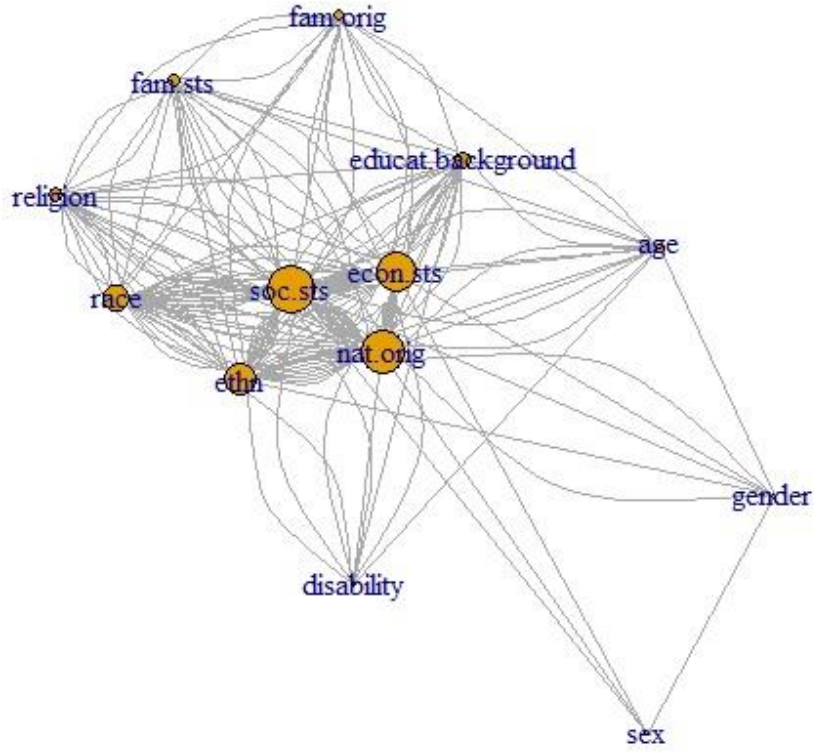
B Asia



C Africa



D North America



E South America

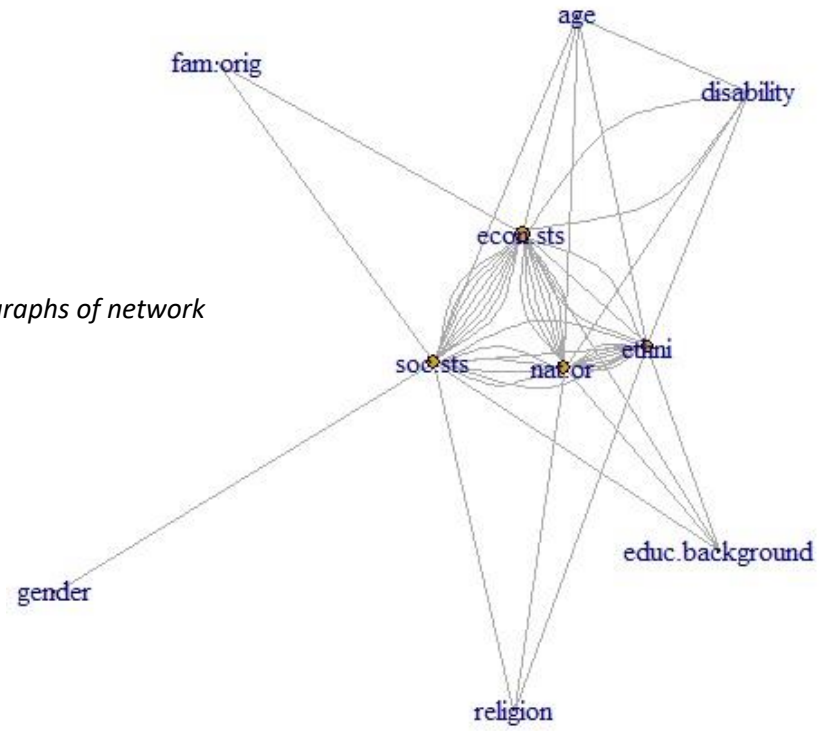


Figure 3.6: (A-E) Plots with graphs of network analysis for all continents.

3.5 Discussion

The findings of RQ1 indicated that the frequencies of diversity dimensions vary significantly among countries. The Global North is generally far more represented than the Global South. On examining a continent's representation of diversity by country, bias is evident across continents. Europe, South America, and North America represented diversity by only one country each—Germany, Brazil, and the US, respectively, with a relative share between 44% and 84%. Asia represented approximately 59% by China (37%) and India (22%). Western European countries account for 90% of the continent's portrayal versus 10% of Eastern European countries. This finding contradicts the Hessian Curricula as it focuses on Eastern Europe. "The eastward expansion of the European Union is taken into account" (translated from the Hessian Curricula, 2021).

Strikingly, Africa is often represented as a whole continent, whereas other regions are differentiated into several countries, thus the homogenization and simplification of African countries in hessian geography textbooks. However, this trend carries a significant risk. According to Hummer (2014), this not only promotes homogenization and simplification but whole false statements. This discrepancy in the depiction of countries in textbooks has previously reported by various textbook analyses, which are trying to classify them to "outer-circle countries" and "inner-circle countries" according to their occurrences (Castro Agudo, 2021; Lu et al., 2022). Outer-circle countries, such as African (Ghana, Kenya, Nigeria, Tanzania, and Zambia) and Asian countries (Bangladesh, India, Malaysia, Pakistan, Philippines, Singapore, and Sri Lanka), are extremely under-represented (Lu et al., 2022). Except for India, this classification applies in this study. Inner-circle (English-speaking) countries are conspicuously highly represented in many analyzed textbooks, such as by Lu (2022), Risager (2021), Toprak & Aksoyalp (2015), Lund (2007), Hong (2009), and Alsaif (2016). Here, this only applies to the US and the UK. This adds to the inconsistency of the inner-circle countries found in prior analyses of different subjects (Xiang & Yenika-Agbaw, 2021). Conclusively, the classification of inner-circle countries appears to be dependent on the context, possibly the national background and subject. Furthermore, prior analyses pointed out the over-representation of Western countries (Lund, 2007; Risager, 2021; Tastan et al., 2016) including Westernization (Hong, 2009) —for instance the dominance of Western cultures over other cultures (Tastan et al., 2016). In this study, the highly represented countries are Germany, China, the US, and India, contradicting this focus on Western countries.

The network analysis pointed out that Europe and Asia exhibit high commonalities in their centrality of represented dimensions, leading to a pattern of representing diversity that differs from the other continents. For both continents, economic status, social status, educational background, and national origin are of similar centrality. Regarding North and South America, despite the varying absolute occurrences, they show similarities between their centrality of represented diversity dimensions, which include the social status, economic status, national origin, and ethnicity. The

similarities between Europe and Asia and between North and South America might indicate postcolonial representations leading to othering (Lippert & Mönter, 2021; Tastan et al., 2016; Zabel, 2022). However, Africa cannot be attributed to any of the patterns. It distinguishes itself through significantly lower centrality of educational background and higher centrality of gender and especially disability than other continents. The interconnectedness of disability and economic status in this network analysis was also observed in previous textbook analyses (Xiang & Yenika-Agbaw, 2021), resulting in stereotypes due to striking dependence on both dimensions. The differing internal dimensions and their high distribution to one of the continents contribute to the biased representation; race is only pointed out for high centrality in North America respectively the US. In Europe, Asia, Africa, and South America, it is absent (1 or 0 code).

This study has some limitations. First is the quality of the statements regarding diversity dimensions in the textbooks. Since the study focused solely on the occurrence of the dimensions, we did not evaluate their quality—for example, positive economic development statements versus problem-focused statements. In addition, Hessian geography textbooks were analyzed, and statements could not be generalized for Germany directly. Furthermore, textbooks always need to select content and never guarantee a comprehensive representation of the world. Our analysis included all Hessian textbooks and found biases when summing up their content. There was no statement regarding the selection of content of individual textbooks.

In conclusion, the results of the overall occurrence of all dimensions and the network analysis showed a biased representation of the world in the geography textbooks. This representation does not coincide with the concept of superdiversity respectively multi-dimensional representation of diversity. The textbooks failed to provide an adequate view of the world integrating diverse perspectives, which is needed for innovative and functioning societies (Nordström, 2008). They simplified the view of our world instead of reflecting superdiverse complex social systems (Vertovec, 2007) and do not support students who can deal with multiperspectivity. This may be because the inherent biases in geography textbooks reflect cultural norms. Second, simplification and homogenization hinder critical thinking, fostering a sense of superiority among dominant groups and distortion among others. This involves the risk of reinforcing stereotypes and specific and biased images of the world, as Usher (2023) addressed the integration of CMCE with Geography.

This bias may stem from a thematic focus on geography that subordinates the representation of countries to the spatial topics they characteristically exemplify. This adds another risk because teachers and students tend to perceive textbooks as sources of accurate information (Gay, 2010; Sleeter, 2005), assuming that authors have adequately considered economic, political, and gender issues (Sleeter, 2005). If these representations go unchecked, the characteristic examples could lead to stereotyping, thereby failing to meet the requirements of the Hessian curriculum. Different reasons

for unbalanced representations have been suggested; Hummer (2014) argues and criticizes the lack of adequate reappraisal of pre-colonial history in the context of representing Africa in textbooks. According to the purpose of this study, we finally want to classify the results as problematic in this context; UNESCO (2017) underscores the importance of diverse identity representation in textbooks in today's globalized world and Uhlenwinkel (2017) on educating students about global citizenship. This is a bias that needs to be addressed further in both textbook writing and geography education research. This could follow the research approach of scholars such as Lee and Catling (2017), who advocated in their "International Research in Geographical and Environmental Education" contribution for leveraging textbook authors' expertise to enhance the development of teaching materials and expert training. In our context, this pertains to expertise in diverse geographical subjects and CMCE.

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Disclosure statement

The authors report that there are no competing interests to declare.

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3.7 Appendix

Table 3.5: Analyzed textbook (Hessian textbook catalogue, 2022).

No.	Title	Publisher	Year of publication	Grade/s
1	Unsere Erde (Gym)	Cornelsen	2018	5–6
2	Unsere Erde (Gym)	Cornelsen	2020	7–8
3	Terra Erdkunde Hessen	Klett	2022	5–6
4	Terra Erdkunde Hessen	Klett	2013	8
5	Seydlitz Geographie (Hessen)	Westermann	2020	5–6
6	Seydlitz Geographie (Hessen)	Westermann	2019	7–10
7	Mensch & Raum	Cornelsen	2016	11–12
8	Fundamente Geographie	Klett	2015	11–12
9	Terra Geographie	Klett	2020	11–12
10	Seydlitz Geographie Hessen	Westermann	2016	10
11	Diercke Geografie	Westermann	2017	11–12

4 Stereotypes in Geography Education – Teachers' Challenges and Strategies

Under review (European Journal of Geography)

Abstract

Stereotypes often arise to simplify and generalize our complex world, but they are usually negatively connoted and can lead to discrimination. In education, they can be reproduced by students, teachers, and subject content. In geography, addressing stereotypes is crucial due to the discipline's colonial origins, which were critically examined starting in the 1960s, with further developments in the 1970s and 1990s. Despite post-colonial calls for decolonization, colonial structures persist, including Western-white predominance and Eurocentrism, especially in the portrayal of Africa. To investigate this in German geography education, we interviewed 13 geography teachers from various states about stereotypes, using qualitative content analysis to evaluate the results. The results show that stereotypes appear across geographical topics, with Africa being notably affected. Challenges include complexity reduction and time constraints. Teachers' strategies are vague, suggesting insufficient focus on these issues in university education. It seems that colonial structures still influence geography education.

Keywords: stereotypes, geography education, geography teachers, secondary education, decolonization, interview study, diversity

4.1 Introduction

Stereotypes are pervasive in societies and significantly influence social dynamics and individual well-being, often perpetuating discrimination (Devine et al., 2012; Eagly & Koenig, 2021; Sue et al., 2007). They originate from categorizing individuals based on attributes such as sex, age, and race and lead to beliefs about psychological traits inferred from observed behaviors, often overlooking situational factors (Eagly & Koenig, 2021; Uleman et al., 2008). This limits the opportunities available to members of the stereotyped group (Cox et al., 2022).

Role information conveyed through personal interactions and cultural representations plays a crucial role in stereotype formation and perpetuation, fostering a consensus that reinforces stereotypes (Eagly & Koenig, 2021). The cyclic process, wherein social roles generate and maintain

stereotypes, underscores the need for policies that diversify roles, especially in educational contexts, to mitigate these biases (Cox, 2023; Eagly & Koenig, 2021).

Geography education should foster respect toward other regions by tackling stereotypes and providing students with insights and the development of a multifaceted worldview (Milner et al., 2021). Therefore, geography teachers must increasingly reflect on these stereotypes and challenge the attribution of stereotype to different regions of the world (Lee, 2018). One difficulty is the unconscious reproduction of prejudices as well as biased representations (Lee, 2018). Implicit prejudices and negative attitudes might influence students' perceptions by steering students toward unfavorable educational outcomes (Luanganggoon, 2020; Tobisch & Dresel, 2017). The educational standards of geography in Germany address a comprehensive understanding of the diversity of nature and culture as an objective of the subject (DGfG, 2020). Increased diversity leads to a lesser dispersion of stereotypes: In homogeneous groups, for example, people develop more strongly differentiated stereotypical ideas (Bai et al., 2020). To generate increased diversity, critical reflection on prejudices against other cultures is also necessary to obtain social justice, which should be ensured through geographical education (Kim, 2019; Lambert, 1995). Furthermore, students should develop awareness about the subjectivity of spatial perceptions, particularly regarding Eurocentric depictions in maps and other representations (DGfG, 2020).

Teaching is multifaceted and requires educators to balance interactions and diverse student needs (Hattie, 2009), which often constrain the former's cognitive resources (Lorenz, 2021). Automatic categorization and generalization occur when information is sparse or ambiguous and cognitive resources are limited (Gawronski et al., 2003). The effectiveness of teaching interrelates with how teachers teach textbook content (Messekher, 2014). Problematically, Dörfel et al. (2024) showed that geography textbooks represent biases, homogenization, and the simplification of all continents. Since teachers play a crucial role in transmitting textbook knowledge to students (Mohammad & Kumari, 2007) and have a high impact on students' perceptions and performance (Leu, 2005), it is crucial to engage with geography educators to analyze the concept of stereotyping in geography education. This should clarify whether these issues merely pertain to the problem of media portrayal or whether they originate from content and stereotypes occurring at a substantive level.

4.2 Theoretical background

Following Hummer (2014) based on Walter Lippmann, stereotypes are "(…) images that exist in people's minds and through which a person tries to categorize their perceptions (p. 13). With stereotyping, one attributes certain characteristics to one's group (…) or the 'Others'. [A]lways associated with them are generalizations and simplifications."

Stereotypes, however, also make it easier for us to understand the world more quickly based on these generalizations (Barrera Mora & Cantor Trujillo, 2007a). People acquire these stereotypes from their social environments, particularly from family and friends (Martiny & Froehlich, 2020) and from media, which, e.g., represents a group of people such as Black people in a certain way, thereby reproducing stereotypes, often without the audience being aware of it (Mitchell et al. 2017). It is important to note that these generalizations are often unfair and negative (Martiny & Froehlich, 2020) toward those who are stereotyped and can even lead to discrimination (Barrera Mora & Cantor Trujillo, 2007a). Many studies have shown that stereotypes influence the evaluation of members from different social groups (Biernat & Manis, 1994; Fiske & Neuberg, 1990). This can be applied to the educational context, such as teacher–student interactions (Cristina Allemann-Ghionda et al., 2006). For example, negative attitudes and stereotypical views toward students with a migration background, such as Turkish students in Germany, lead to a poorer assessment of their performance (Sarah E. Martiny & Froehlich, 2020).

Walter Lippmann (1992) identified four essential stereotype characteristics: (1) Stereotypes are acquired secondhand, not from direct experience with the stereotyped group. (2) All stereotypes are false; this can be understood as a scale ranging from less false to strongly false, also taking into account the degree of harm caused. (3) Stereotypes are resistant to change. (4) Stereotypes are simpler than reality, which is why they persist.

Additionally, the effects of stereotypes on the level of harm can be illustrated according to Timmer (2011). Three main types of harm by stereotyping can be derived: (1) misrecognition effects, where groups are denied equal society standing; (2) distribution effects, resulting in unequal resource allocation; and (3) psychological effects, including internalized biases leading to anxiety and reduced achievement (Fraser et al., 2021).

In the context of school respectively education, stereotypes play a significant role, especially in geography education. Students can draw on not only their own direct experiences but also their indirect knowledge about places they have not personally experienced, which can be stereotypical (Roberts, 2023). For example, students often associate the African continent with terms like "mud huts," "tribes," and "wildlife" (Bowden, 2021). This very one-sided portrayal of the continent is not only stereotypical but also reflects many misconceptions that students have and which need to be addressed (Bowden, 2021). Misconceptions can be defined as "beliefs that are contrary to known evidence" (Taylor & Kowalski, 2004). Reasons for these misconceptions may include a lack of understanding of the underlying theoretical concepts (Sanger & Greenbone, 1997). As Timmer (2011) highlights the risk of misrecognition effects by stereotyping, we derive that misconceptions are closely related to stereotyping and often result from it. This underscores the importance of the disclosure and correction of stereotypical beliefs. Finally, misunderstandings underscore the challenges in geography

education, where students often possess oversimplified or inaccurate perceptions of geographical locations, cultures, and socio-economic conditions (Carano & Berson, 2007). Addressing these misconceptions is crucial in geography education to foster accurate understanding and critical thinking about global diversity and geographic realities (Carano & Berson, 2007). By disproving stereotypes, educators can enhance students' geographical knowledge and promote a more nuanced worldview.

4.2.1 Decolonization, post-colonization, and stereotypes in geography

The origins of the discipline of geography stem from colonial knowledge productions, which dominated the field for a long time (Oswin, 2020). Criticisms emerged in the late 1960s and 1970s through radical, Marxist, and humanistic geography (Oswin, 2020), followed by critical race study approaches in geography (Jackson, 1985; Jackson & Smith, 1981). In the 1990s, anti-colonial movements prompted a first rethinking of various geographical disciplines, with a new understanding of culture as heterogeneous and power relations (Oswin, 2020) and, simultaneously, the recognition that "whiteness" continues to be directed as a dominant ethnic force (Anderson, 1998). However, colonization has left many legacies that have not been fully addressed within the discipline, suggesting the subject is still structured by colonialism (Anne Bonds & Inwood, 2016; Leeuw & Hunt, 2018; Morrissey, 2014; Shaw et al., 2006; Sundberg, 2014)

Postcolonialism questions Western claims and calls for a decolonization of the field (Gilmartin & Berg, 2007; Radcliffe, 2022b). However, decolonization so far has been rather inadequate and controversial and not a fixed concept (de Leeuw & Hunt, 2018; Noxolo, 2017). It is crucial to recognize that knowledge is always context-specific and embedded in power structures (de Leeuw & Hunt, 2018). Postcolonial theory offers a critical perspective on colonial power relations based on, among other things, concepts of decolonization (Blunt & McEwan, 2003; Gilmartin & Berg, 2007).

A defining feature of the colonial structure in geography is the imprint of Eurocentrism (Jackson, 2014; Sundberg, 2014) and a predominantly Western-white worldview, which geography must confront critically (S.-A. Radcliffe, 2022b). Critical geography, an important form of resistance, aims to pursue decolonization (Radcliffe, 2022; Radcliffe, 2018). Progress can only occur when geographers engage in anti-racist and decolonial work and confront white privilege and racism (Daigle & Sundberg, 2017; Radcliffe, 2022). This includes the contributions of Indigenous peoples (Gergan, 2015; Shaw et al., 2006), people of color, women, and queer individuals (Radcliffe, 2022b) and involves building new patterns of co-existence based on plural knowledge (Howitt, 2020).

Without these steps, colonial structures will continue to shape the field of geography. For example, the portrayal of Africa according to Western conceptions and colonial legacies depicts the continent as a symbol of global demographic, environmental, and societal stresses (Kaplan, 1994b) and as a place of misery, chaos, and brutality (Mercer et al., 2003). In general, the representation of the continent is still negative, especially with regard to poverty, diseases, hunger, and dirt (Poncian, 2015;

Takele Ayane & Mekonnen Mihiretie, 2024; Weiner, 2016). Another challenge is the reductionist view of "Africa as a country" rather than a mosaic of nation-states (Mercer et al., 2003) and 'Afro-pessimism.' The latter focuses on the antagonism between Black and non-Black individuals, replacing the traditional binary system between white and Black (Ray et al., 2017; Webb, 2020). It emphasizes the 'afterlife' of slavery and examines how slavery persists in modern forms (Hartman, 1997). Ultimately, colonial structures manifest through simplified representations—stereotypes that reduce the entire continent to chaos and disaster. As Pieterse and Parekh (1995) summarize, "the legacy of 500 years of Western expansion, including 200 years of Western hegemony, reflected in racism and exoticism, continues in the form of stereotyped images of non-Western cultures." A conceptual tool is needed to reclaim the Africa that has been erased by colonial discourses and representations and Western epistemologies (Ramutsindela, 2021; Tarisayi, 2023).

Given the origins of the discipline and its continuing entanglement in colonial structures, investigating the extent of these resulting simplified representations or stereotypes in current geography education is crucial. It is essential to examine whether and how these structures are currently reflected as stereotypes in geography education by teachers.

4.2.2 Levels of stereotyping in schools

Stereotyping may occur at different levels, and we differentiate between three within our context. First, teachers might stereotype students. Second, students can stereotype, and finally, geography subject content may reproduce stereotyping.

4.2.2.1 Teachers

Stereotypes can subtly influence teachers' judgments about students. This pressure can lead educators to make quick attributions influenced by stereotypes (Reyna, 2008). Teachers' stereotypes may include generalized beliefs about the academic performance of certain social groups, linking students' group membership to specific levels of average achievement (Froehlich et al., 2020; Lorenz, 2021). Stereotypes not only describe group characteristics but also offer explanations for behaviors and outcomes (Reyna, 2008). Socio-economic disparities and systemic challenges heighten the likelihood of group-based attributional judgments among white and minority educators (Reyna, 2008).

4.2.2.2 Students

Scott (1999) analyzed the perceptions and views of U.S. students regarding developing countries and concluded that these judgments are primarily based on stereotypes. He provides examples given by students, such as "to me, the Third World is a place where hunger and hardship are widespread. (…) Poverty and disease are as common as mosquitoes on a summer day in Minnesota. The water you drink and the food you eat are all polluted and decaying" (Scott, 1999). Stereotypes develop as early as in childhood (ages 4 to 9; (Martiny & Froehlich, 2020). Heberle and Carter's (2020) study also revealed a

connection between economic status, age, and stereotyping: Among privileged children aged 4 to 9 years old, a linear increase in stereotyping with age was observed, which may be explained by increased contact with stereotype-confirming examples, such as through media. Various forms of media, particularly social media, should be therefore considered and studied as potential influencing factors in the formation of stereotypes. For instance, Ward and Grower (2020) reviewed the influence of media on the development of gender stereotypes and concluded that media use contributes to traditional gender role attitudes. The significance of this influence is further supported by the amount of media consumption, with 31% of adolescents using media for more than 6 hours a day (during the COVID-19 pandemie 46% > 6 hours; (Voss et al., 2023). Although media is not the only factor in the formation of gender stereotypes, social media, in particular, is used several times a day by almost 70% of adolescents, according to studies by Rideout and Robb (2018) and You et al. (2023). This suggests that social media could have a substantial impact on the development of gender stereotypes, as supported by Alvares (2018). This highlights the importance of uncovering students' pre-existing perceptions and providing insight into what needs to be changed in the classroom to minimize these stereotypical views.

4.2.2.3 Geographical subject content

Willinsky emphasized as early as (1999) not only that students bring stereotypes into schools, but that the curriculum followed also influences and reproduces certain perspectives and positions regarding other cultures and societies. Such a curriculum can even aim to indoctrinate students with specific knowledge, stereotypes, and fantasies about people from different cultural backgrounds (Willinsky, 1999). When textbooks are closely aligned with the curriculum, the latter exerts a significant influence on the learning process (Appel et al., 2015; Fuchs et al., 2014); textbooks serve as crucial mediators between the intended curriculum at the policy level and the implemented curriculum at the classroom or school level (Valverde et al., 2002). A study highlighted how textbooks construct differences between Asia and the USA, illustrating how Americans are meant to perceive Asia to embed colonial messages (Hong, 2009). Willinsky (1999) referred to this as the colonial legacy in education. Results of textbook analyses in geography suggest a content-based academic problem related to stereotyping (Myers, 2001; Portera, 2004; Schuermans, 2013). Regarding gender stereotypes, many school textbooks have been reproducing such stereotypes for some time by depicting women in stereotypical professions and attributing stereotypical emotional reactions to them (Macaulay & Brice, 1997), as well as presenting stereotypical women's and men's roles in the family (Tabatadze & Gorgadze, 2023). Another finding is the traditional Eurocentric perspective, which, according to Chang et al. (2006), is reproduced through textbooks. Asians are consistently depicted in specific locations and grouped by nationality and ethnicity (Zhang et al., 2021). This leads to stereotypes and misconceptions, as the simplified portrayals of Asians, which promote social hierarchy, do not reflect the actual experiences of the learners (Zhang et al., 2021).

4.2.3 Dealing with stereotypes

Despite their prevalence, stereotypes can be elusive to detect and understand, as they simplify our perception of others through group categorization despite their detrimental consequences (Fraser et al., 2021). Therefore, it is crucial to be aware of and to appropriately apply methods for handling these issues related to stereotyping.

4.2.3.1 Student–teacher level

One approach to dealing with and preventing stereotypes is multiculturalism: It aims to consciously acknowledge and appreciate diverse cultural identities (Grießig et al., 2022). This involves positively evaluating and reorienting the stereotyped domain (Grießig et al., 2022). The diverse climate shaped by multiculturalist school norms can promote a positive ethnic-cultural identity (Moscardino et al., 2019 August; Schachner et al., 2016). It is important to highlight commonalities and neither focus on nor dismiss differences, as this could reinforce stereotypical images of various cultural backgrounds (Civitillo et al., 2019; Gutiérrez & Unzueta, 2010).

4.2.3.2 Subject-specific relevance

The German educational standards of geography demand, under the competence of 'acting' and in the first sub-dimension, specifically regarding knowledge of relevant information and strategies, that students know ways to uncover and influence prejudices (e.g., toward members of other cultures; (Deutsche Gesellschaft für Geographie, 2020). Furthermore, UNESCO (2017) outlines strategies to avoid stereotypes, including using inclusive language, representing diverse identities, and integrating human rights. It also highlights promising practices to avoid stereotypes and biased terms, such as reflecting on how cultures once labeled as "primitive or barbaric" have now achieved global recognition as well as using precise terminology to avoid ambiguities and hasty generalizations, such as not confusing "religion" with "fundamentalism" (UNESCO, 2017).

The relevance for the subject of geography can be explained by the following aspects: (1) The challenge of representing heterogeneity, as geography extensively engages with the diversity and heterogeneity of the world (Taylor, 2017). Pedagogical tools, such as comparison, contrast, and narratives of change, are crucial in helping students understand the differences and similarities between different places and across time. These tools must not simplify or stereotype complex realities (Taylor, 2017). (2) In geography education, evaluative elements associated with comparison and contrast are utilized. There needs to be an awareness in geography education of how specific criteria for comparison (e.g., between countries) are established and how these perceptions and evaluations of places can influence understanding (Taylor, 2017). (3) In geography education, the use of comparison and contrast is often linked to power dynamics and positioning, highlighting the critical importance of

reflecting on these aspects. It is crucial to ensure that the representation of places and cultures does not contribute to reinforcing stereotypes or reproducing hierarchical structures (Taylor, 2017).

4.2.4 Research aim and research questions (RQs)

Stereotyping can emerge in geography classes via teachers, students, and the content itself (Froehlich et al., 2020; Lorenz, 2021; Scott, 1999; Willinsky, 1999). This is because the discipline's colonial knowledge origin continues to shape the field, perpetuating Eurocentric and Western-white perspectives (Radcliffe, 2022; Radcliffe, 2018). School materials are biased according to this perspective (Hong, 2009a) and often reproduce stereotypes (Myers, 2001; Portera, 2004; Schuermans, 2013). However, little is known about how stereotypes are encountered in classroom situations. Teachers are the most influential factor in education (Hattie, 2009) and should help us understand which stereotypes are present in current geography education and why they persist. We therefore aim to answer the following questions:

RQs

1. Does stereotyping occur in geography lessons, and if so, how and why?
2. What challenges exist in addressing stereotypes?
3. What strategies do teachers use to deal with stereotyping in geography lessons?

4.3 Method

In this chapter, we outline the research design, including the recruitment of participants and the analytical approach and evaluation strategies used.

4.3.1 Sampling: participants and recruitment

We recruited 13 participants for a semi-structured online interview (via BigBlueButton) through the Association of German School Geography (Verband Deutscher Schulgeographen). The interviews were expected to take about 60 minutes and, in fact, lasted between 54 and 110 minutes. Due to difficulties in recruitment, we additionally used a pyramid scheme to be able to represent a diverse interview group (Table 4.1). We made sure to avoid biases in the representative group. Therefore, we interviewed teachers of all age ranges (26y–78y, m = 456 y). Two out of the thirteen teachers were pre-service teachers. Overall, the sampling group represented diverse levels of experiences regarding (1) school type and (2) grade. Regarding the school type, it included teachers from both 'Gymnasien' (*n* = 9) and 'kooperative Gesamtschulen (KGS)' (*n* = 4). A "Gymnasium" represents the highest level of secondary education in Germany, culminating in an "Abitur." A "KGS" combines a "Hauptschule" (general secondary school), "Realschule" (intermediate secondary school), and "Gymnasium" under one roof, though each branch is taught separately. In terms of grade, the sampling group included teachers that worked with grades 5–13, which means lower, middle, and upper grades of secondary level 1 and 2 in

Germany (5–9/10–13). We also included teachers from across Germany to avoid spatial biases. This also involved considering both urban and rural schools, as well as the varying levels of migration backgrounds of the students in these schools. The prerequisite was that the interviewed teachers had studied geography. Regarding these variables, no patterns could be identified regarding content or statements. This applies to all of the variables.

Table 4.1: Overview of sampling (n=13).

Pseudonym	**Gender**	**Age**	**Federal state**	**School type**	**Experience (grades)**	**Second subject**
D1	W	54	Hesse	kooperative Gesamtschule (KGS)	5–9	Evang. religion
D2	M	78	Thuringia	Gymnasium	5–13	German
D3	M	31	Brandenburg	KGS	5–13	Biology
D4	M	39	Lower Saxony	Gymnasium	5–13	Sports
D5	W	49	Hesse	Gymnasium	5–13	Physics
D6	M	39	Lower Saxony	Gymnasium	5–13	Sports
D7	M	43	Lower Saxony	KGS	5–13	History
D8	W	30	Hesse	KGS	Lower grade, 10^{th}.	Arts
D9	M	58	Saxony	Gymnasium	5–12	Mathematics & Informatics
D10	M	57	Lower Saxony	Gymnasium	5–13	Biology
D11	W	60	Hesse	Gymnasium	5–13	Evan. Religion
D12	W	28	North-Rhine Westphalia	Gymnasium	5–13	Sports
D13	M	26	North-Rhine Westphalia	Gymnasium	5–13	Sports

4.3.2 Interviews

It should be noted that we conducted more comprehensive interviews than the part we will focus on for the analysis in this study. Therefore, the additional sections of the interviews covering diversity, Eurocentrism, subject content, and the potential of the subject are excluded here due to the

comprehensive data, and the focus will be on the concepts of stereotypes and stereotyping, along with the associated challenges.

First, we asked the teachers about their understanding of stereotypes respectively stereotyping in an unbiased manner. Second, a scientific definition of stereotyping from Hummer (2014) was presented to establish common ground. After an initial general discussion of stereotypes, the focus shifted to their relevance in teaching. Previous studies across various subjects have shown that stereotypes and stereotyping play a role in classroom instruction (Chang et al., 2006; Hong, 2009; Macaulay & Brice, 1997; Zhang et al., 2021). Additionally, colonial structures remain present in the subject of geography, which, according to Kaplan (1994) and Mercer et al. (2003), can manifest in stereotypical representations of Africa, where the continent is portrayed solely in a negative light. Therefore, the next question intended to explore experiences with stereotypes in geography teaching. If examples from the teachers' own geography classes were provided, we also addressed how these were handled. This is based on the theoretical understanding that colonial structures and related stereotypical representations can only be addressed if they are acknowledged (Mercer et al., 2003).

Since stereotypical representations, especially from a postcolonial perspective, persist (Barker & Pickerill, 2024; de Leeuw & Hunt, 2018; Bonds & Inwood, 2016; Morrissey, 2014; Shaw, 2006; Sundberg, 2014), it is interesting to understand what challenges and external factors impede them being adequately addressed.

In developing the interview guide, we followed Helfferich's (2022) approach, which adheres to this principle: "As open as possible, as structured as necessary (p. 879)." The four-step approach includes (1) collecting questions (gathering all relevant aspects of the research interest as possible questions), (2) reviewing the questions (critically assessing their suitability), (3) sorting (arranging them in a logical temporal and content sequence), and (4) subsuming (formulating prompts for each group of questions that encourage narrative responses).

The interview questions and structure resulting from this process are shown in Table 4.2. To keep the interview process open, we decided not to categorize our guiding questions into different levels of stereotypes, such as content-related stereotypes, stereotypes reproduced by students, or those replicated by teachers themselves. However, we included examples from all three levels, as provided by the teachers in response to the relevant guiding questions.

Table 4.2: Guidelines for semi-structured interviews with guiding questions and follow-up questions structured based on the two thematic subfields.

Thematic block	**Guiding questions**	**Follow-up questions**
Stereotypes & stereotyping	*What do you personally understand by stereotypes?*	
	What do you therefore understand by the process of stereotyping?	*"What stereotypes do you associate in relation to the subject matter?*
	(Showing the definition of stereotypes): *Do you agree with this definition of stereotypes?*	*Is there any deviation from your understanding?* *And if so, why?*
	Are there examples of stereotypes or stereotyping in your geography lessons?	*Are stereotypes reproduced, for example, through content; regions, countries, or continents; or materials in your geography lessons?*
	How do you handle it when stereotypes are reproduced in your geography lessons?	*Do you ignore stereotypes when they arise?* *Do you reflect on stereotypes with your students?* *Do you also critically examine stereotypes in your teaching?*
Challenges	*What additional support might be needed from external sources to adequately deal with stereotypes?*	*What challenges do you face regarding …* *university education?* *materials?* *professional development?*

4.3.3 Transcripts

After conducting the interviews, we decided to focus on evaluating the *stereotypes* and *challenges* sections for this research. The recordings allowed transcripts of all the interviews to be produced using the software "NoScribe" (version 0.4.1) by Dröge (2023). All the transcripts were subsequently manually checked twice, and errors were corrected. We applied the transcription rules of Kuckartz and Rädiker (2022).

4.3.4 Qualitative content analysis

The transcripts were analyzed using structured qualitative content analysis. More specifically, we developed a category-guided system by following the seven iterative steps of Kuckartz and Rädiker's

(2022) procedure model: (1) The data were carefully read, text passages were marked, and memos were written. Subsequently, case summaries were produced for all the interviews. Due to long answers, we first paraphrased all the interviews to categorize the interviewees' statements for better clarity. (2) We then defined coding units based on meaningful segments. We identified 182 coding units. The main categories (stereotypes and challenges) were deductively derived based on our research questions. Deductive subcategories (examples, strategies) were derived from our interview questions. (3) The entire material was initially coded using these deductive main categories and subcategories. Each coding unit can contain multiple categories, but each category is only counted once per unit. In the next step (4), inductive main and subcategories were exploratively formed within the material. (5) The final coding framework was then used to code the entire material again. Figure 4.1 shows a tree diagram with the structure of all the deductive and inductive categories. The final coding framework is shown in the appendix. (6) Different types of analysis were then applied to analyze the material, which will be explained in the next chapter. (7) Finally, we wrote the results chapter. We used MAXQDA Analytics Pro (24.4.0) as the technical implementation of coding, evaluation, and visualization (Kuckartz, 2024).

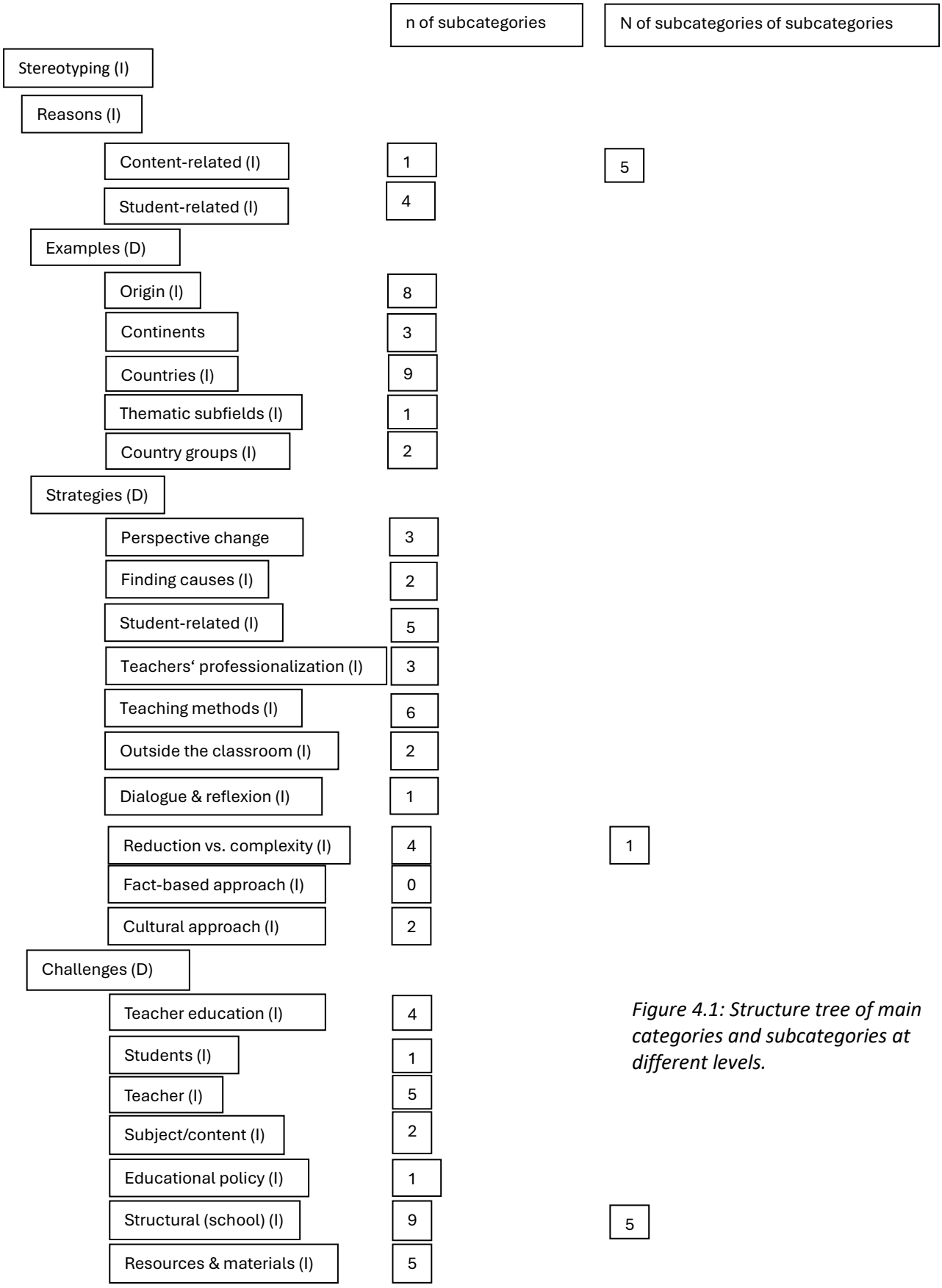

Figure 4.1: Structure tree of main categories and subcategories at different levels.

4.3.5 Outcome quantification

To give an in-depth analysis of the answers, we will structure the qualitative results for each RQ based on the quantitative results and provide insights with regard to noticeable categories. All three levels at which stereotyping can be expected to arise (teachers, students, and subject-content level) will be addressed in the results.

We used four different levels to evaluate the codings: (1) We began by counting the number of subcategories within each main category to determine their absolute occurrence. (2) We then normalized these occurrences by calculating the relative frequency of each main category, including all the subcategories, across the interviews and visualized the results using a pie chart in Excel. Following this, we visualized the absolute occurrences of all the subcategories in tables, structured according to their main categories. (3) To capture the occurrences of the categories across the interviews, we calculated the number of codings per interview, ensuring that each category was counted a maximum of once per interview. This method helped prevent data distortion from repeated mentions within a single interview. (4) Finally, we examined the proportion of subcategories within each main category to calculate their relative occurrence. This was normalized using fractions to highlight the relative importance of the subcategories within each interview. We used Excel to visualize these quantitative occurrences for each category.

Limitations

Some limitations should be mentioned. All the teachers participated voluntarily, and a bias could result from the dedication of these teachers. Furthermore, due to the sensitive nature of the topic, it is possible that not all the teachers were willing to fully disclose information or that some were unable to provide comprehensive answers in the spur of the moment without further reflection. Moreover, the teachers were aware of the interview topic beforehand, which allowed them to potentially familiarize themselves with the topic.

4.4 Results

We will present the qualitative results by structuring them based on our three RQs and, then, substantiate them with the four quantitative evaluations. We will not present all the examples listed in the tables but will instead provide an overview of certain ones that stand out due to their frequency of mention (mentioned by a minimum of 6 teachers). Nonetheless, all the tables are included in the appendix and should provide a comprehensive overview of the results and reflect the diverse insights.

4.4.1 RQ1: Does stereotyping occur in geography lessons, and if so, how and why?

We will first represent the examples teachers mentioned and give reasons why stereotyping plays a role in geography classes. Figure 4.1 shows that the maximum occurrences of continents, countries, and thematic subfields are similar (14–17). However, when looking at the relative occurrences within each main category, we see differences due to the varying numbers of subcategories in these main categories (Tables 4.2 & 4.3; Figure 4.1).

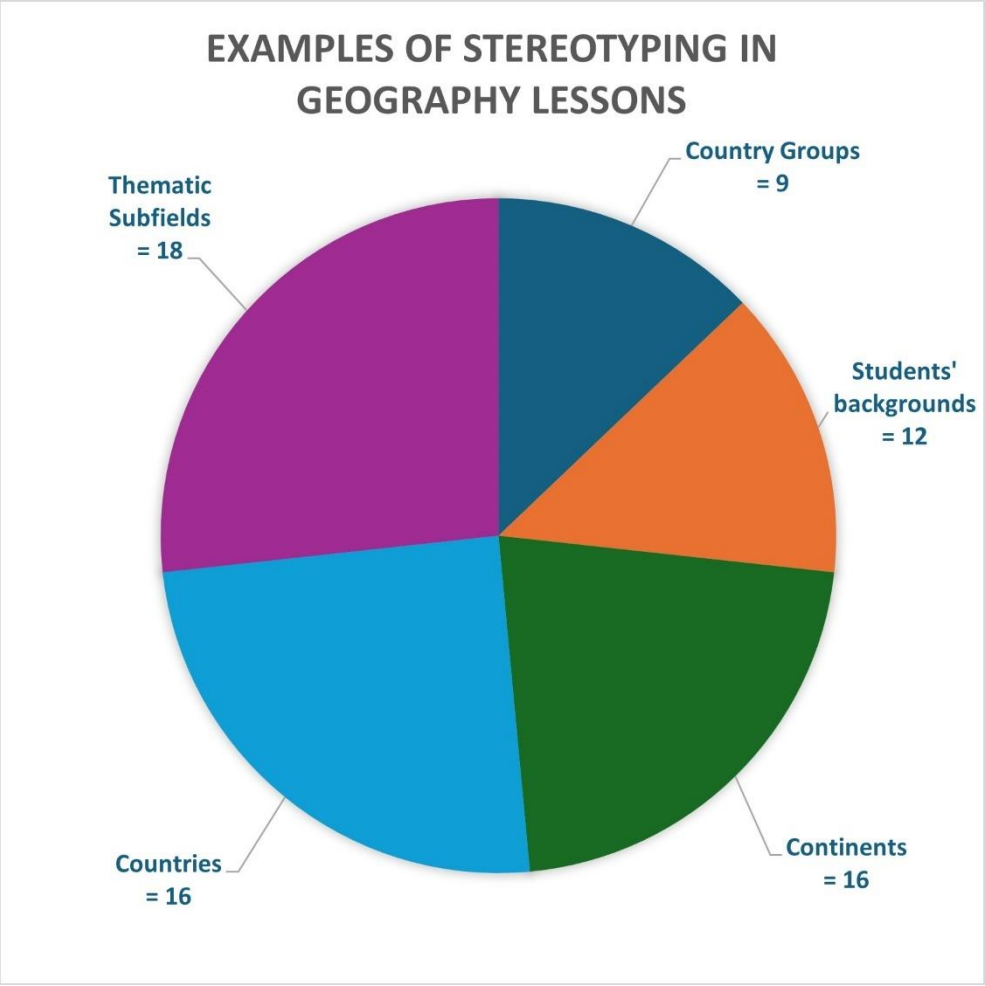

Figure 4.2: Examples of stereotyping in geography lessons by subordinate categroies. Numbers = absolute occurrences; piechart = percentage-based.

Table 4.3: Absolute n, absolute n by max. 1 per teacher, and relative occurrences within the subcategory of continents as examples of stereotyping.

Continents	**Absolute n**	**Absolute (max. 13)**	**Relative (in subcategory)**
Continents	2	2	12.5%
Africa	9	7	56%
Asia	3	3	19%
North America	2	2	12.5%
Total	16	14	100%

Africa is the absolute most common stereotype in geography classes, with 7 out of 13 teachers mentioning Africa as a stereotype (Figure 4.2): "When Africa is the topic, many young people and children often associate it with significant underdevelopment and poverty. It's a common perception of the region as a third-world area" (D7, 41) and D8 (48) said: "I mean, sentences like 'everyone in Africa is poor' or something like that". D9 agrees with Africa as an example of stereotyping: "... but otherwise, those stereotypes fit right in there: poverty, sometimes war, hunger. That's what happens" (41). Table 4.3 shows that Africa is by far the most mentioned continent in the context of stereotyping by all the teachers.

The countries and thematic subfields referenced are diverse, and no examples were mentioned by more than three teachers (Tables 4.2 & 4.3). D8 (38) mentioned poverty as a subfield and potential stereotyping theme: "Yeah, especially with the topic of poverty that I'm focusing on right now, I'm working hard to address stereotypes among my students. For them, being poor means only those who have to use a hole for their bathroom needs. They don't consider someone poor if they have a roof over their head. That's just not true. They need to understand the difference. Of course, you're still poor if you don't have a toilet, but you can also be poor even if you do have one." With regard to physical geography, a misconception concerning deserts was once referred to as a stereotype (D7, 35): "When talking to children, the first thing they associate with deserts is sand—sand deserts. In the Sahara, at most 20 percent of the desert areas are sand deserts. The rest are stone and gravel deserts." Taking a closer look at the main category of "country groups," we frequently observe stereotypes about developing countries: "So, the first thing that comes to mind is the classic categorization into industrialized countries, emerging economies, and developing countries. The initial images that emerge, which are sometimes reinforced and sometimes challenged in our teaching, are that in developing countries everyone is starving, everyone is poor, and everyone is uneducated" (D3, 47). D13 (8) added: "It starts with these terms themselves. Personally, I rarely use the term 'developing countries' in my teaching because I find it somewhat problematic. One can refer to them as the so-called developing countries, but even with this term, there's always the question of whether all

countries go along the same developmental path. Do all countries need to follow the same developmental trajectory, or is industrialization even a relevant benchmark for a developed country given the current climate policy conditions?"

The "students' backgrounds" category includes different forms of specific origins, such as national backgrounds like Syrian, Ukrainian, Russian, or more generally, the parental origin. All the examples in this category were related to the students themselves. For instance, D6 commented: "I would definitely say that it concerns the social or financial background of the family. In the context of societal issues, I've recently noticed that certain stereotypes, especially regarding open lifestyles from the Arab world, are increasingly coming into focus (...)" (47). An example regarding national origin is as follows: "Logically, we have some Syrian or Afghan students at our school. And when the topic of migration comes up, you do think about how to handle it. (...) You try to present it to the students and their peers in a way that avoids creating uncomfortable situations" (D4, 49).

Overall, stereotypes were exemplarily presented on two levels (n = 72): (1) the disciplinary level, meaning that stereotypes are reproduced through the content of the subject matter, and (2) stereotypes reproduced by students. Only one teacher noted having had stereotypical views themselves in a classroom example: "The second time I taught this topic as part of a spatial module in Lower Saxony, it was called North Africa and the Near East. Two or three years ago, it was still referred to as the Orient and the Near Orient. I realized that I probably had rather stereotypical views myself. And in both classes, I had students from those regions. At that time, even from Syria, and I was very grateful because they provided a different perspective on the entire area and the cultural background" (D10, 37).

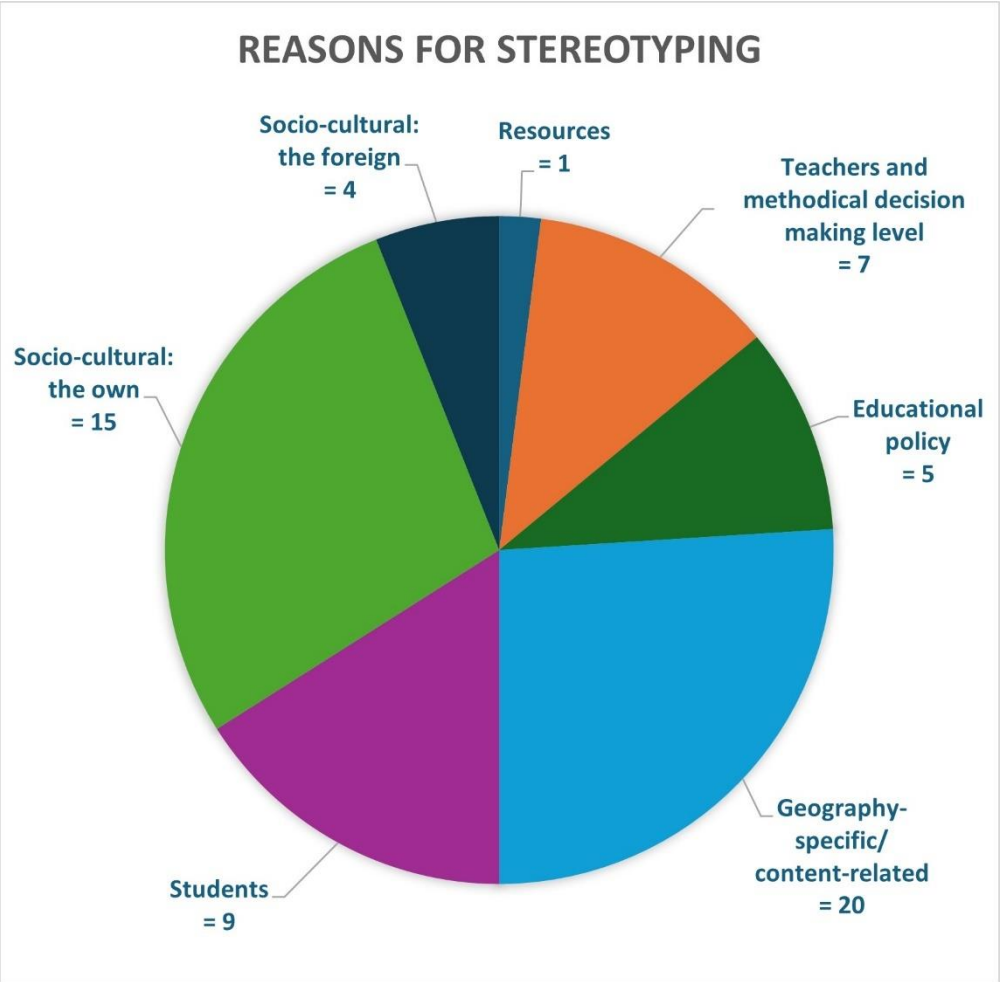

Figure 4.3: Reasons for stereotyping in geography lessons by subordinate categories. Numbers = absolute occurrences; piechart = percentage-based.

An inductive category was formed, because many teachers mentioned reasons for stereotyping when referring to examples from their geography lessons. Figure 4.3 gives an overview of the main categories, which we will differentiate between in the next step.

The most mentioned main categories are 'socio-cultural—the own' and 'geography-specific and content-related' reasons. Tables 4.4 and 4.5 provide a deeper insight by showing the subcategories of both the main categories.

Table 4.4: Absolute n, absolute n by max. 1 per teacher, and relative occurrence within teachers and within the subcategory of geography-specific reasons of stereotyping in geography lessons.

Geography-specific/content-related	**Absolute n**	**Absolute (max. 13)**	**Relative (in subcategory)**
More stereotypes in higher grades as lower grades focus more on physical geography, which has fewer stereotypes	1	1	8%
Stereotypes are necessary because complexity cannot be fully captured; they facilitate communication	2	1	8%
Stereotypes occur inevitably; everyone has them, and stereotyping largely happens automatically	2	2	15%
Rarely are individuals examined in class, leading to generalizations of societies	1	1	8%
Complexity must be reduced for students; didactic reduction is part of the teaching process	13	7	53%
Geography often addresses problems, which can negatively affect the image of countries if only negatives are discussed	1	1	8%
Total	20	13	100%

With 7 mentions out of 13, 'complexity reduction' is the most frequently mentioned reason for stereotyping. D3 (61) explains: "Many things we discuss in our topics need to be simplified for easier learning, but reducing the content and complexity always sacrifices naturalness or reality. Instead, as we move toward simplification, we tend to move toward stereotyping on the continuum." This kind of balancing act is supported by D5 (62): "The other issue is the legitimate or justified desire to not initially complicate things too much because students have to deal with an incredible variety of topics in a relatively short period and with little preparation from middle school. In particular, there's always this slight difference, I find, or this fine line between, well (...) a good model that's understood and something that somehow becomes black-and-white and biased (...). That's often difficult, I find."

Table 4.5: Absolute n, absolute n by max. 1 per teacher, and relative occurrence within teachers and within the subcategory of socio-cultural reasons leading to stereotyping in geography lessons.

Socio-cultural reasons	**Absolute n**	**Absolute (max. 13)**	**Relative (in subcategory)**
a) The foreign	4	Absolute: 3	(18%)
- Low proportion of foreigners leads to racism	1	1	6%
- Limited information about other societies leads to generalizations	2	1	6%
- The foreign can provoke resistance and therefore increase stereotypes about the foreign	1	1	6%
b) The own	15	Absolute: 14	(82%)
- Anything not related to Europe leads to quicker stereotyping	2	2	12%
- Socialization leads to Eurocentrism	4	3	18%
- Projecting one's own values onto others and thus generalizing norms and values	1	1	6%
- Own cultural identity narrows perspective; own culture seen as normal, others as deviant	6	6	34%
- Socialization leads to normalization of one's own culture; narrows perspective, other cultures are generalized	1	1	6%
- "Our" history leads to assumptions of superiority; others are seen as inferior, which leads to stereotyping	1	1	6%
Total	19	17	100%

Furthermore, 'own cultural identity' as a reason was mentioned by almost half of the teachers (46%): One's own cultural identity narrows their perspective and can portray other cultures as

divergent or different. "Generally, I would say, especially or often in spatial examples that are completely unfamiliar to us, where we have no or fewer preconceptions" (D12, 9). D9 (41) agreed: "So, it's quite rare that the stereotype is thoroughly discussed because very few students have been to an African country (…). But otherwise, those stereotypes fit right in there." In addition, being "the foreign" can be a reason for stereotyping as knowledge of other cultures can be limited and, therefore, often generalized: "So, fundamentally, I would say, always or often in spatial examples that are completely unfamiliar to us, of which we have no or very few notions" (D12, 9). "Then, of course, one looks at an exemplary person, an exemplary life, and I think it is very difficult for students to acknowledge that this is just the experience of one single person" (D12, 7).

Another reason for stereotyping at the level of teachers themselves, specifically in methodological decision-making, can be the emotionalization of content, such as that in textbooks: "One is always exposed to images that are meant to be highly emotional, like children with hunger bellies and the villages where they live. Of course, such examples exist, but often in geography classes, only these are shown and not the super high-tech developed capital of the respective country in Africa or Asia or wherever. That aspect then tends to be neglected because it doesn't quite fit into the thematic focus" (D3, 47). At the same time, D3 highlighted the flip side of presenting a comprehensive image: Because they do not represent a formulated educational goal to be achieved, aspects were simply omitted due to the need to reduce complexity. D3 further elaborates on the aspect of emotionalization as follows: "The foreign always ignites a certain fascination. A classic example is comparing two life stories. On the one hand, there's the life story of, let's say, Tina from Germany. Tina is white, marries at 26, has a maximum of two children, and earns a lot of money. And then, on the other hand, contrasting this, is the life story of a completely marginalized girl from Africa, from some village, who at 14 already has 20 children. Of course, this is a very exaggerated portrayal. This is naturally fascinating for the students" (61).

4.4.2 RQ2: What challenges exist in addressing stereotypes?

The challenges faced by teachers and the needs they must have met in schools to avoid stereotyping are diverse. Figure 4.4 gives an overview of the main categories regarding the 'challenges.'

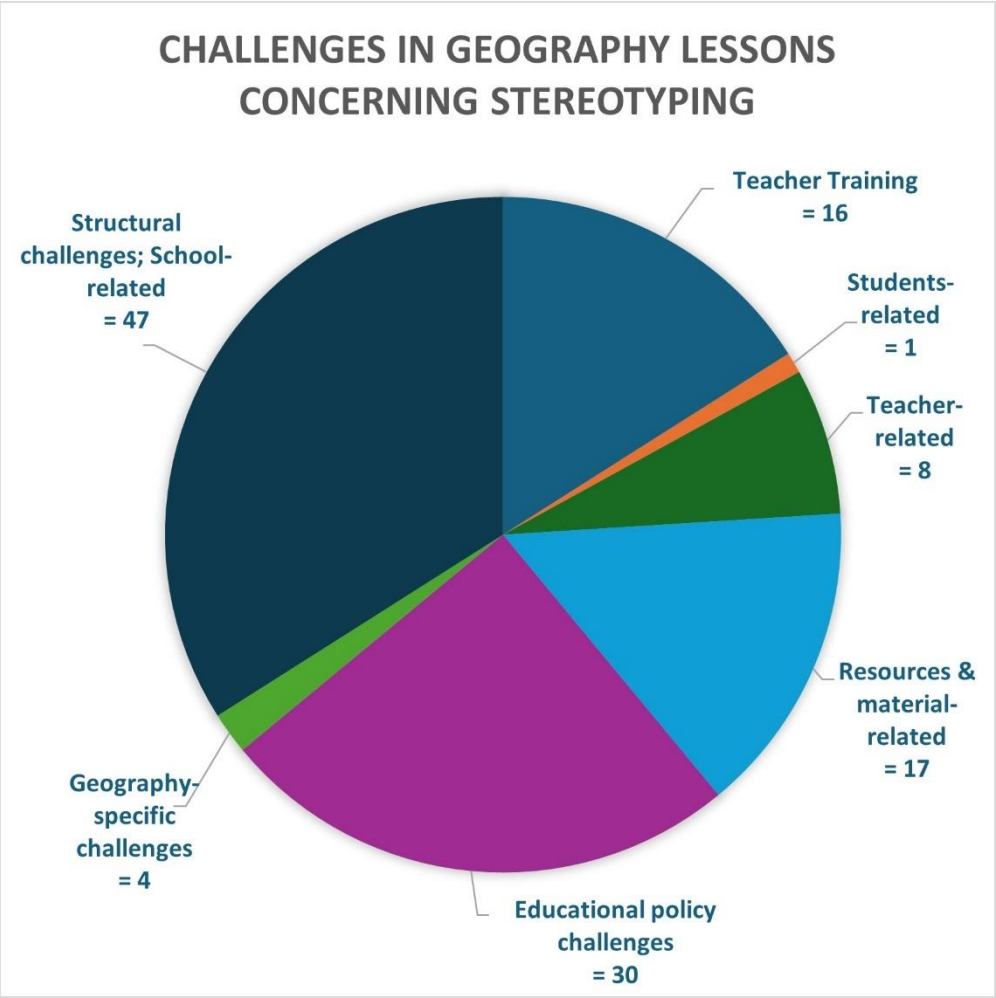

Figure 4.4: Challenges in geography lessons concerning stereotyping by subordinate categories. Numbers = absolute occurrences; piechart = percentage-based.

The educational policy challenges and structural challenges (in schools) almost share a maximum of 22, respectively 30, and a 'lack of time' represents the most common type of structural challenge: 69% of the teachers mentioned a 'lack of time' in one way or another (Table 4.6).

Table 4.6: Absolute n, absolute n by max. 1 per teacher, and relative occurrence within teachers and within the subcategory of educational policy challenges concerning stereotyping in geography lessons.

Structural (school-related)	**Absolute n**	**Absolute (max. 13) (max. 13)**	**Relative (in subcategory)**
Material resources (e.g., equipment for field studies): no room for alternative approaches	1	1	3%

Teachers need more freedom; otherwise, it is difficult to address or differentiate such topics	1	1	3%
Diversity is not a core issue in schools, so focus is on other things; diversity is neglected	1	1	3%
Shortage of skilled personnel and understaffing, preventing focus on issues like stereotyping	3	3	10%
Transfer of research to schools is limited: research results mostly remain unimplemented	7	5	18%
Digitalization: Few media available for variety	2	2	7%
Assessment structure (reliance on tests) leads students to do only what is required for tests	1	1	3%
Class size limits individual attention	1	1	3%
Lack of time leads to many subsequent problems	23	9	31%
- Missing project-based teaching, no space for concepts like stereotyping within "normal teaching"	3	2	7%
- Lack of content basis, no differentiation	1	1	3%
- Proposals (e.g., regarding diversity & stereotyping) are often too consuming	1	1	3%
- Lack of interdisciplinary teaching, leading to limited perspectives and lack of systemic thinking	1	1	3%
- Restricted creativity due to lack of time	1	1	3%
Total	47	30	100%

The different challenges concerning educational policy are shown in Table 4.7. The low appreciation of the subject of geography as well as the limited numbers of hours are cited as reasons for the lack of focus on stereotyping, as there is hardly any time to address aspects beyond the core curriculum. This directly relates to the challenge mentioned by five educators, where the curriculum acts as a 'straitjacket' and makes it difficult to meet thematic requirements. This, in turn, can be connected to the time shortage reported by 9 out of 13 educators, which represents a structural issue. "So, for the subject of geography, we would need to increase both the number of hours and the importance of the subject. This would allow us to incorporate more competencies and content that are highly relevant but have so far been overlooked" (D5, 106). D11 (107) added that time is a big factor,

which is the main structural challenge in schools (Table 4.6): "With our six hours in middle school, we just can't cover much. So, you have to, well, time is a major factor." "The problem is also that if you want to critically question something, you need the time for students to recognize it themselves" (D11, 117). D3 (97) mentions another consequence of a lack of time: "So, it also has to do with time management and personnel planning, and so on. We have so little time to actually focus on our core tasks because we have to manage classes, organize things, and handle a lot of bureaucratic paperwork. We simply don't have the time to reinvent the subject." Geography-specific challenges, in contrast, are much less common, with only two different aspects mentioned by two teachers.

Regarding materials and resources (17 codings), various issues were mentioned: Teachers find the material almost equally challenging, as 62% stated that they consider the material to be deficient: "Yeah, I have to say, that's often where the problem lies; we work with textbooks a lot. I believe we simply need more time in many aspects to engage more deeply with individual spatial examples. Instead of just quickly covering one example and moving on, students might question whether it is like this in the entire area. They need to look more closely and have different people examine various circumstances within an area. This is likely done more in higher grades, but I mostly teach lower secondary. Moreover, we need textbooks and materials that don't promote stereotypes and perhaps preemptively address these issues. As a teacher, I find it very challenging to manage this, especially with a full-time position and time constraints, and to independently gather materials that deviate from the curriculum or the available resources." (D12, 26) D3 added: "The publishers just look at the curriculum guidelines, then start researching, creating their materials, and designing the book based on those guidelines. I think the very last ones to feel any need to be quick or super progressive are the publishers. They are just machines that implement what the curriculum guidelines dictate." (101)

Concerning the education of teachers, 6 out of 13 referred to the limited university education regarding these issues: "I don't know if the topic is even being addressed by students in practical teaching areas at the moment. If it isn't, it would be beneficial if universities started implementing the topic through practical preparation or other similar events. Then, it could also find its way into schools more effectively. I think it's harder to say we'll introduce it from the outside into the current teaching staff. I believe that all the topics that come from universities and through teacher trainees, because they already possess that knowledge, face easier acceptance in schools" (D1, 103). D3 (99) also saw potential with regard to this point: "So, I think if one can take liberties to rethink things, it's definitely better to do so at university."

4.4.3 RQ3: What strategies do teachers use to deal with stereotyping in geography lessons and why?

Figure 4.5 gives an overview of the strategies the teachers mentioned to deal with stereotypes. Most of the strategies can be assigned to the "dialogue and reflection" category (almost 30% overall). Looking

at the subcategories, except for the "discuss stereotypes in plenary" category, all the other approaches are individual ones (Table 4.9). "So, I first try to find out what the stereotypes look like and then try to start a conversation and, of course, attempt to dissolve these stereotypes over the course of the lessons" (D1, 48).

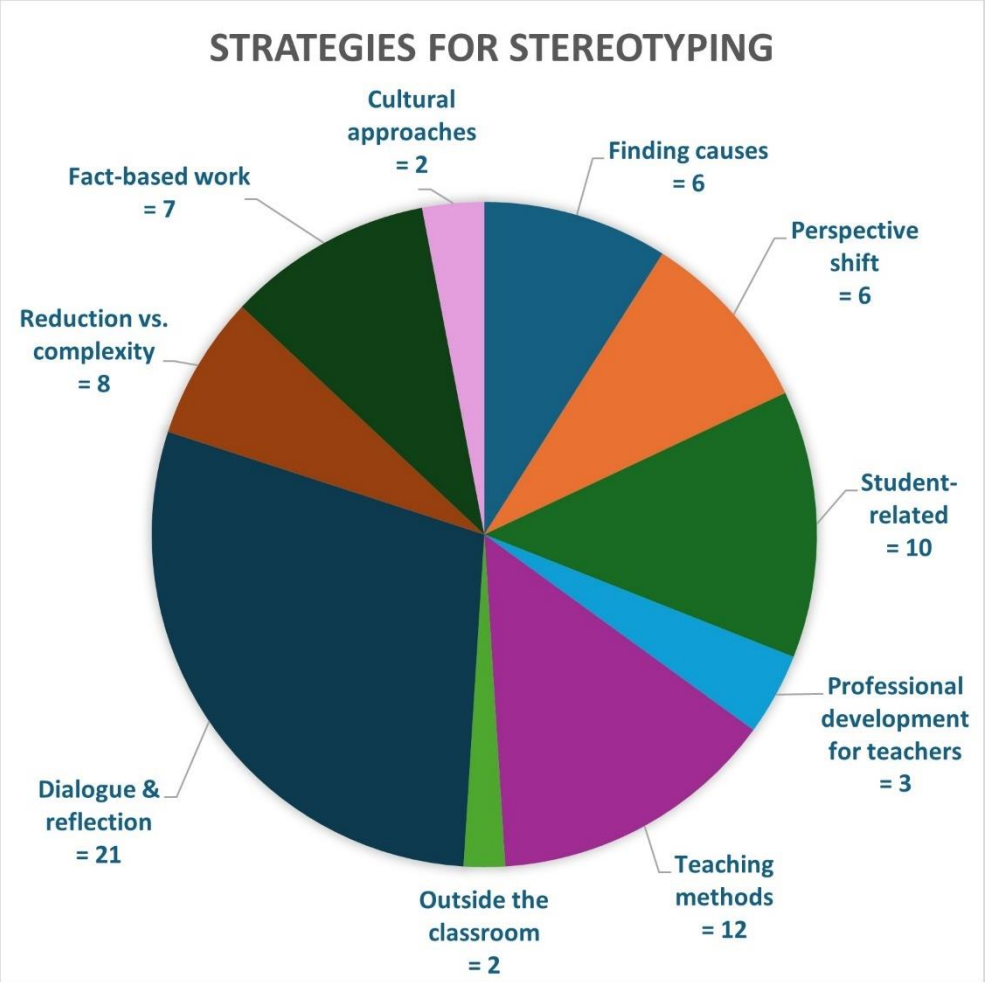

Figure 4.5: Strategies to deal with stereotypes in geography lessons by subordinate categories. Numbers = absolute occurrences; piechart = percentage-based.

Table 4.7: Absolute n, absolute n by max. 1 per teacher, and relative occurrence within teachers and within the subcategory of "dialogue and reflection" as strategies to deal with stereotyping in geography lessons.

Dialogue & Reflection	**Absolute n**	**Absolute (max. 13)**	**Relative (in subcategory)**
Clarify misconceptions from surveys	1	1	5%
Create neutrality to resolve stereotypical views	2	2	10%
Consider author intentions (e.g., caricatures): What is the author exaggeratedly drawing attention to? Avoid misinterpretations	1	1	5%
Discuss stereotypes in plenary	11	10	50%
Reflect to uncover and eliminate stereotypes	1	1	5%
Conscious vs. unconscious handling of stereotypes	1	1	5%
When stereotypes appear, follow up and address	1	1	5%
When stereotypes appear, address and differentiate	1	1	5%
When stereotypes appear, recognize and resolve	1	1	5%
Talking about stereotypes can help	1	1	5%
Total	21	20	100%

Others use visual approaches as a teaching method: "Therefore, I need to check prejudices at the beginning. For example, if I want to treat Africa as a continent and go through various countries exemplarily, exploring what culturally characterizes them and so on, I will start the lesson by saying, 'You have 15 minutes to draw everything that comes to mind about Africa.' This provokes the extreme release of all prejudices. From there, we can work on addressing them" (D8, 40). Furthermore, D12 said: "Sometimes, I choose a different medium. It might sound strange at first, but if we've only been working with the textbook, for example, sometimes I find it helpful to show a different perspective with film clips, for instance, and bring in that visual aspect again. Of course, this doesn't help with every stereotype. But, sometimes it's useful when you introduce different viewpoints, maybe even through interviews" (11).

To work on stereotypes, it is of utmost importance that teachers have a strong awareness of themselves, which is part of 'teachers' professionalization." "Yes, I think we should generally try to counteract stereotyping more. That is, to curb it, even though it is incredibly difficult in everyday teaching. However, it shouldn't be the case that we as the geography subject promote or advance these stereotypes. That shouldn't be the goal. Instead, I think teachers should be aware of this, be conscious of it, and then, of course, counteract it accordingly" (D12, 22).

Complexity reduction is also addressed again; it is a balancing act between reduction and generalization in teaching, where differentiation and diversity can help avoid stereotypes. "I find this quite challenging because, on the one hand, you don't want to overwhelm students with too much complexity on a topic, and on the other hand, you don't want it to become completely black-and-white or overly simplistic" (D5, 58). D13 (20) said: "I believe that stereotyping should definitely be reduced in teaching as much as possible. One should always aim to present and discuss diverse, multi-perspective content."

Finally, one teacher encouraged his students to discuss development projects, intending to create cognitive dissonance: "When white German students think about a development project in Africa and genuinely believe they could do it better, that approach to the project is already somewhat paternalistic" (D2 46). He further justifies his goal: "I have always loved to place students into such cognitive dissonance, meaning, telling them at the end what the actual situation is that they have fallen into, because it triggers an aha effect and a sense of concern" (D2 50).

4.5 Interpretation of results

In summary, this study represents the first exploration of geography teachers' perspectives on stereotypes in geography lessons, yielding valuable insights. The first research question regarding whether stereotypes play a role in geography classrooms was unequivocally answered affirmatively by all the teachers. The manifestation of stereotypes varies significantly, with the teachers providing diverse examples that rarely overlapped, except for Africa, which was mentioned by more than half of the teachers interviewed. Overall, these examples often revolved around countries, continents, and students' backgrounds and the risk of categorizing countries without nuanced differentiation across various levels. Factors such as colonization and its consequences are frequently overlooked.

The reasons behind the occurrence of stereotypes in geography education were derived inductively and unanimously attributed to the necessity of simplifying complexity. Additional factors include curriculum requirements and instructional materials. Approaches to addressing stereotypes also varied widely, with little consensus except for the unprepared strategy of spontaneous conversation clarification. Nonetheless, numerous strategies were identified that warrant further testing for their efficacy in future research.

4.5.1 Discussion

We will now take a more detailed look at and discuss the key findings. First, it is striking that all the teachers agreed on the definition of stereotyping as mentioned, establishing common ground. However, stereotyping occurs in every thematic subfield, as the teachers mentioned examples for each subfield.

Furthermore, it is noticeable that the examples of stereotypes in geography classes in general were extremely varied. Except for Africa, the examples differed significantly. The fact that so many different examples were mentioned (n = 64) by 13 teachers indicates that stereotypes indeed play a significant role in geography education. More precisely, the teachers mentioned that most of the stereotypes they encounter in geography classes are related to national origin (countries and continents) or different geographic subfields. Common attributional stereotypes, such as gender, age, and race, identified by Uleman et al. (2008), were not mentioned in the interviews. This could be due to the geographical content, which predominantly deals with nations and ethnicities (cultures), thus potentially leading to more frequent stereotypes in these areas. This significant finding prompts the question of whether geography content itself reproduces stereotypes. The structure of the subject, which increasingly deals with spatial examples, may contribute to this. Additionally, the realization that teachers primarily cite national stereotypes and the specific subfields of human and physical geography supports this hypothesis. Frequent comparisons made in the subject, for instance, between countries, could further reinforce this ambivalent perspective.

Moreover, the geography-specific respectively content-related reasons represent the majority of reasons for stereotyping despite constituting only a small fraction of the mentioned challenges. This discrepancy suggests that while teachers are aware of subject-specific reasons for stereotyping, they do not classify them as challenges, which could potentially form the basis for action. 'Complexity reduction' is the most common geography-specific reason for stereotyping and was mentioned by more than half of the teachers. The "tightrope walk" between generalization and reduction for teaching purposes is also addressed by teachers and emphasized as difficult. In particular, this is closely related to the most frequently mentioned challenge: "a lack of time." It can be inferred that these factors negatively influence each other. Regarding the time factor, similar assessments from teachers are found in other studies. Concerning diversity as the opposite of stereotyping, teachers in the study by van Middelkoop et al. (2017) expressed that they cannot consider diversity in their teaching because they lack the time for it. One cause is the tight curriculum, which contributes to the lack of time.

An appropriate reduction of complexity without stereotyping should already be taught in university education, but the current implementation is insufficient, leading to a lack of professionalization. This can also explain why almost all the teachers brought up the very "vague" strategy of conversational clarification. Even though this strategy is also intended to dissolve stereotypes through plenary discussions, it is very unspecific and not a targeted measure. Explanations of how exactly this should be implemented varied significantly among the teachers. This possibly indicates that they react spontaneously; however, what remains uncertain is whether it is a targeted and deliberate strategy for coping. The problem of inadequate training in terms of this aspect is also highlighted by other studies; they report insufficient preparation courses for teachers to consider

diverse settings and multiculturalism (Kolano et al., 2013/2014; Villegas & Lucas, 2002). Educators must receive the appropriate training in multiculturalism to adequately deal with multicultural students, but there is a lack of implementation skills in teacher education (Gay & Howard, 2000). A previous study also showed that educators believe that integrating multicultural education will enhance the quality of teacher training and improve student performance (Yilmaz, 2016). Furthermore, van Middelkoop et al. (2017) reported that teachers feel very uncertain due to a lack of competencies and do not possess didactic skills for adequate handling. Prior studies identified another strategy for dealing with stereotypes. They can be countered by supporting diversity, which ultimately aims at the opposite: diversification instead of generalization. Diversity training typically occurs in various settings, including workplaces and beyond (Paluck et al., 2021). It employs specific educational programs designed to promote positive interactions between different groups; reduce prejudices and discrimination; and enhance participants' abilities, knowledge, and motivation to engage effectively with diverse individuals (Bezrukova et al., 2016). It is crucial to address stereotypes at the beginning of teacher education in universities (Yendell et al., 2023), as university education can help to reduce stereotypes (Stephens et al., 2022).

Finally, the teachers criticized the teaching material, such as textbooks, for reproducing stereotypes. The representation of Africa is considered to be particularly problematic with regard to two aspects: First, Africa is mostly mentioned in the context of negative aspects respectively problems (e.g., social and economic) and, second, the generalization of the whole continent. This critique corresponds to the results of Dörfel et al. (2024), which identified that Hessian geography textbooks transport biased representation. Both the teachers' reports and the textbook findings by Dörfel et al. (2024) demonstrate a homogenization of the entire continent. In this regard, it can be concluded that the results of the textbook study reflect an even broader reality, as evidenced by the exploratory nature of the interviews and the examples mentioned from geography classes. Furthermore, time constraints and the issue of stereotypical materials reinforce each other: When time is limited, teachers often rely more on textbooks, which, however, carry the potential risk of reproducing stereotypes and biases.

The primary issue lies in teachers being unconsciously influenced by stereotypes due to their limited cognitive resources and the complexities of teaching (Herppich et al., 2018). These automatic processes of categorization and generalization often result in rapid, stereotyped judgments, which detrimentally affect students' expectations and educational prospects (Froehlich et al., 2020; Gawronski et al., 2003; Hattie, 2009; Lorenz, 2021; Reyna, 2008). This misalignment can undermine the effectiveness of teaching, as research suggests that teachers often struggle to consistently and accurately assess the individual needs of their students (Ready & Chu, 2015; Rubie-Davies, 2015). Concerning the potential harm mentioned by Timmer (2011), the psychological effects including internalized biases are particularly relevant, leading to anxiety and reduced achievement by students.

This currently presents a dilemma that must be addressed both academically and in terms of competence development. Therefore, alongside content-related changes, structural changes are indispensable; on the one hand, appropriate training sessions must be designed specifically for the geographical context, addressing the topic of stereotypes and their management. On the other hand, teachers must be given time to implement these approaches effectively. Conceptually, in geography education, no approach has been developed so far on how to reduce stereotyping in geographical content.

Overall, it appears that teachers primarily perceive stereotypes in their students rather than in themselves, although some acknowledge that no one is free from stereotypes. This suggests that there is insufficient critical awareness of one's own stereotyping, which poses the risk that stereotypes may remain unexamined. This could ultimately lead to the continued perpetuation of colonial structures, even if unintentionally. Stereotypes are mainly externalized, with teachers often stating that due to a lack of time, a reduction in complexity is essential, which can lead to the reinforcement of stereotypes among students. There is also an overall lack of subject-specific reflection: None of the teachers mentioned postcolonial structures within the subject that could trigger stereotyping. Without addressing this, it will be difficult to tackle such stereotypes. Since geography originated from colonial knowledge and decolonization has been called for decades, the results can be seen as problematic. Critical geography, which advocates for anti-racist and decolonial frameworks to address Eurocentrism and racism (Radcliffe, 2018, 2022), is evidently not yet a reality in German geography classes. This suggests a need for more practical and earlier guidance in university education, a point strongly criticized by the teachers we recruited. Therefore, our study also supports the thesis that the subject of geography continues to be influenced by colonial structures, as previously noted by Bonds and Inwood (2016), Leeuw and Hunt (2018), Shaw et al. (2006), and Sundberg (2014). This is evidenced by the fact that "Africa" was the only consistent stereotype addressed by over half of the participating teachers. There is still a prevailing sense of superiority, and the "image of Africa" is heavily reduced and homogenized to underdevelopment and poverty, as shown by many studies from various contexts and disciplines. The fact that this issue is not adequately addressed and that the colonial history and origins of the subject are not reflected upon sufficiently can be inferred from the vague strategies of the teachers, with only one out of thirteen addressing colonial history within geography education. This issue is not critically addressed or demanded (Radcliffe, 2022b; W. S. Shaw, 2006b). One teacher also raised the problem of dominant whiteness by criticizing that Europeans often see themselves as "white rescuers," mentioned as a core problem (Radcliffe, 2022b; W. S. Shaw, 2006b). We need to begin integrating the contributions of diverse people to avoid the dominance of the white Western perspective (Daigle & Sundberg, 2017; Gergan, 2015; Howitt, 2020; S. S. Shaw et al., 2006). As observed in the U.S., racial disparities among students and teachers have already led to increased recruitment of

teachers of color (Deutschmann 2022). A white-dominant colonial logic can have severe consequences for Black, brown, and other marginalized people across domains such as economic or cultural fields (Alvarez & Farinde-Wu 2022), as well as on structural decisions (Jacobson et al. 2022). Thus, an important implication is to further diversify the teaching workforce in Germany, which involves, for example, making training structures more attractive to international students. Concerning the problem of addressing colonial structures, there are not many studies on how teachers deal with colonial structures in the field of geography. Laing (2020) developed a module for universities, where colonial structures are questioned and perspectives of Indigenous and formerly colonized people are emphasized. She stresses that decolonization aims for social change, not just theory, and highlights movements like Black Lives Matter as examples of this transformation (Laing, 2020). However, this issue is not addressed across the board, suggesting that it does not seem to be a central concern. Without engagement, which starts with making the issue central to the awareness of all geography teachers, colonial structures will continue to persist. As a central approach, university education should more strongly address the origins of the subject and promote deep engagement as a foundation, as well as providing training during teaching practice to convey or stimulate adequate strategies for addressing these issues.

4.6 Conclusion

Through the interviews, we now have more insight into persisting colonial structures in geography classes in Germany. We have learned not only that stereotypes persist in German geography classes but also that teachers need to critically examine their own roles. This includes questioning what it means for a white teacher in Germany to talk about the world.

Given the background of the sample, with it primarily consisting of engaged teachers who responded to the call, it is crucial to raise awareness about the problem. It seems that stereotypes and colonial structures are a blind spot in German geography education. This needs to be addressed in the politics of curriculum making and admission procedures in textbook writing, geographical education research, and teacher education.

Disclosure Statement

The authors report that there are no competing interests to declare.

4.7 References

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5 Summary

Based on the goal of the UMRdivers project to prepare student teachers for diverse classrooms (Center for Teacher Education Marburg, 2022), my work aimed to explore a potential tension within the field of geography. This tension arises between the need and requirements to consider diversity (Hessian curricula, 2021, 2023) and the risk of perpetuating stereotypes rooted in the subject's origins in colonialism (Radcliffe, 2022). A comprehensive textbook analysis of all licensed Hessian geography textbooks (Paper 1 & 2) revealed both a homogenization of the African continent and a general bias in the representation of the world. Interviewing a representative sample of German geography teachers (Paper 3) confirmed that stereotypes are common in geography class. Accordingly, stereotypes are present in geography education, particularly in the context of Africa. The key findings of the three studies will be summarized now and their interrelations highlighted.

The results of the first study on the general depiction of diversity in geographical content are striking: while all dimensions are present, they differ significantly in their frequency. External dimensions are generally much more represented than internal dimensions, especially the economic status, social status, and educational background. The textbook analysis also reveals a interdependence between the grade of the textbook and the thematic focus with regard to the representation of diversity dimensions. The highest number of diversity dimensions can be identified in textbooks for middle school grades (7th and 8th). In contrast, geography textbooks for lower school grades (5th and 6th) represent the fewest dimensions. Textbooks for upper school grades show representation levels that fall between those of the lower and middle school grades. The representation of diversity dimensions also varies significantly depending on the thematic focus. By far, the highest number of diversity dimensions is found in the content area of “Population Geography,” which accounts for 39% of all identified dimensions. This is followed by “Globalization” with 15% and “Countries and Continents” with 14%.

But does the representation of dimensions differ regarding countries and continents? This questions was answered by calculating the absolute occurrences in the context of a) continents and b) countries. An anamorphosis of the world scaled by the number of mentiones of diversity dimensions in the context of continents (a) visualized striking results: Europe and Africa appear disproportionately large, while Asia and Oceania are barely visible. On the country level (b), however, the picture changes: North America and Asia dominate the map with Europe (remains unchanged), and Africa appears notably small.

Since this is still a summation of all dimensions, the question was raised whether there are differences in the connections between the dimensions when categorized by continent. The network analysis, which statistically calculated this, shows me following anomalies in the representation of continents:

- **Europe & Asia**: Highest centrality are the economic and social status, and the national origin. Of middle centrality are the educational background, ethnicity and age. All others are in a third row and of low centrality.
- **North & South America**: Economic and Social Status, national origin and ethnicity are of equal high centrality in their networks. All other dimensions are in second row of low centrality. In the North American network also race is of high centrality, which constitutes the exception.
- **Africa**: The African networks differs highly from the other continents, as only the economic status is of high centrality, and all other dimensions are more or less connected with the economic status. Additionally, the dimension of disability holds a higher centrality in the African network than in any of the other networks.

In the third study all teachers confirmed, that stereotypes were present in geography class. However, there was a particular finding: The exemples of stereotyping provided on teachers showed little overlap, except in one main category – continents. Over half of the teachers noted that stereotypes often appear in relation to Africa in geography lessons. This was the only point of consensus among the teachers, and they explained it as follows: the complex topics in geography often require didactic simplification. A few teachers explicitly elaborated on the challenges of balancing black-and-white thinking (thus stereotyping) and with the necessary reduction of complexity is very difficult. However, focusing this subject-specific challenge was the exception. Most teachers refered to structural challenges, with time constraints being at the forefront, to explain stereotypical reduction. This lack of time prevents deeper engagement with content-related challenges and thus may contributes to reinforcing stereotypes. So how do teachers handle situations when stereotypes are reproduced in class? Primarily, they rely on highly individualized strategies. One recurring theme among these strategies falls under "dialogue and reflection" – a category characterized by vague responses like "addressing," "questioning," or "breaking down" stereotypes, these strategies remain imprecise, and it's unclear what they entail.

In summary, a fundamental challenge in geography education appears to be the reduction of complexity. Structural issues, such as time constraints, inadequate materials, and insufficient training in teacher education, might lead to stereotyping. This issue becomes particularly challenging when no clear strategies are available to address these issues. Combining the results of all three studies cohesively, I come to the following primary findings:

1. Overall, geography education presents a highly distorted view of the world, which is inadequate and does not reflect the diversity and reality of the (diverse) students themselves. Instead, by presenting identities in a homogenized and biased way in teaching materials, this

approach can lead to stereotyping and discrimination of students, as highlighted by other researchers (Devine et al., 2012; Eagly & Koenig, 2021).

2. The interviewed teachers unanimously reported stereotyping in geography lessons. While the examples provided were mostly individual, there was broad consensus regarding the stereotype of "Africa." The stereotypes suggested in the textbooks appear to resonate, at least within this group, which was highly diverse in terms of age, federal state, second subject, school type, and teaching experience.

5.1 Discussion & conclusion

The findings indicate that the representation of the world in geography education is not adequately portrayed but rather highly distorted and stereotyping plays a significant role in geography education. The textbook analysis in Paper 1 shows an imbalanced representation of diversity dimensions in textbooks, showing a clear interdependence between the topic and grade. Paper 2 confirms that a bias is evident for all continents: the Western world is over-represented, South America is under-represented, and Africa is homogenized as a single entity. Furthermore, the diversity dimensions represented in the context of Africa differ markedly from those in other continents which indicates the concept of “Othering”.

The findings align with previous research on textbooks from other subjects which show similar results: A dominance of the mainstream culture leads to Eurocentrism (Civitillo et al., 2019; Araújo & Rodríguez Maeso, 2012), which is given also in my analysis by reinforcing biased perspectives that marginalize non-Western regions. The homogenization of Africa was also highlighted by Usher (2023) and Hummer (2014b) while the continent is associated with poverty and disaster. These portrayals echo postcolonial critiques of racism and Afro-pessimism (Marmer, 2013; Poncian, 2015). Moreover, Lippert & Mönter (2021) highlight that simplification and biases, which were also identified in my analysis, create distorted worldviews, leading to stereotypes about Africa. In general, different researchers underscore that a lack of diversity in geographical content fosters stereotypes globally (Araújo & Rodríguez Maeso, 2012; Usher, 2023). This is problematic, as teachers and students rely heavily on textbooks as accurate sources (Gay, 2010; Sleeter, 2005). Furthermore, this imbalance challenges the goal of effectively addressing the needs of diverse students, as textbooks fail to include diverse identities, thereby violating requirements set by curricula, federal commissioner, and UNESCO.

The interviews with geography teachers provide further insight into how stereotyping plays a significant role in geography classes. Two key aspects regarding examples of stereotyping were striking. First, while the answers provided by the teachers were largely unique, there was one notable exception: the agreement that Africa is a highly reproduced stereotype in geography class. This was

also found in the late 90s and early 20s, as teachers identified stereotypical depictions of Africa to poverty or Aids as prevalent in textbooks and teaching (Kaplan, 1994; Mercer et al., 2003). The persistence of such stereotypes about Africa in geography classes reflects the colonial roots of geography as a discipline: These stereotypes are not merely accidental but embedded within the structure of the subject itself, which has historically been used by colonial powers to assert control and propagate a Eurocentric worldview, promoting dominant whiteness (Oswin, 2020; Radcliffe, 2022; Shaw, 2006). The lack of critical reflection in both teacher training and curricula perpetuates these colonial continuities. Other researchers add that teachers globally struggle with unconscious stereotyping and a lack of diversity training (Ready & Chu, 2015; Herppich et al., 2018).

A major reason for stereotyping cited by the teachers of my interviews is the need to reduce complexity for students, especially given the challenge of limited time. This is consistent with findings from other studies, where a lack of time and pressure to cover content is seen as a key factor in reinforcing stereotypes (Hummer, 2014; Herppich et al., 2018). Moreover, my interviewees, along with other studies (Kolano et al., 2013/2014; van Middlekoop et al., 2017), point to a lack of adequate teacher training as another significant challenge.

These findings thus present an even greater challenge for geography (education), as will be briefly explained now: As textbooks continue to exhibit Eurocentric perspectives, biased worldviews (as shown in Paper 1+2), and stereotyping Africa remains common in geography class (Paper 3), it becomes evident that colonial structures still shape geography education. This conclusion is supported by various researchers who highlight the persistence of these structures within geography (Bonds & Inwood, 2016; Pieterse & Parekh, 1995; Nagre, 2023; Lippert & Mönter, 2021; de Leeuw & Hunt, 2018; Morrisey, 2014; Sundberg, 2014). The distorted and simplified representations of geographical content point to an underlying problem, which continue to maintain colonial structures (Radcliffe, 2018; Belina, 2014). According to Weichhart (2016) & Helbrecht (2014), institutional resistance and limited engagement with critical geography play a key role in sustaining these continuities. Indeed, 50 years after Kiel (1969), many researchers still conclude that geography has not achieved lasting changes but rather persisting traditional content (Haversath, 2020; Helbrecht, 2014).

These persistent, distorted representations hinder critical thinking, social cohesions, and appreciation for global diversity (Greaney, 2006; Usher, 2023). The importance of fostering critical thinking is underscored by its role in advocating for anti-racist and decolonial frameworks, which challenge Eurocentrism and racism in geographical education (Radcliffe, 2018; 2022). This, in turn, represents an important foundation for achieving the second goal: addressing the needs of a diverse student body. However, further adjustments based on the findings and the persistence of stereotyping and Eurocentrism in the field of geography must be pursued and deepened. What we can identify and

deduce at this point is, above all, a significant tension between the demand for diversity and the perpetuation of stereotyping in the field of geography.

5.2 Outlook

As the results and discussion have shown, several key areas require further research and action to address these issues. First, the issue of textbooks as perceived sources of truth (Gay, 2010; Sleeter, 2005) must be addressed. The biases and continuities observed in the representation of the world in current textbooks are particularly concerning, as students tend to regard them as accurate sources. The requirement to incorporate diverse perspectives that reflect the reality of our society (Hessian curricula, 2021, 2023) should therefore be rigorously assessed before textbooks are approved. Economic considerations increasingly play a role in the provision of teaching materials (Macgilchrist, 2015), and education is becoming more entangled with economic interests. This raises concerns about the outsourcing of teaching resources (Ball & Youdell, 2009), the shifting of skills and knowledge to external providers (Höhne, 2013), and the involvement of transnational corporations in the production of instructional materials (Lohmann, 2014). This underscores the need for comprehensive assessment and critical evaluation of textbooks and their content.

Secondly, preservice teachers should be encouraged to critically reflect on teaching materials, which would lay the foundation for a more professional and diverse approach to education. Promoting a critically conscious pedagogy in teacher education can enable pre-service teachers to consider the interests, competencies, and backgrounds of their students (Vandeyar, 2024) and value cultural pluralism as the norm (Paris & Alim, 2017). This approach would ensure that the diversity of students is recognized and appropriately addressed. Pre-service teachers could evaluate existing teaching materials to identify and question stereotypes. Developing strategies to address and counteract stereotypes in geography lessons is a key part of this effort.

Thirdly, it can be identified the need to break the continuity of biases perpetuated since the origins of the discipline by further research. Reflecting on current global developments in the wake of colonialism, Vandeyar (2024) highlights the shift from "global colonialism" to "global coloniality." This gradual process requires further exploration to understand its ongoing impact on education. In this context, it could be valuable to examine studies like that of Vandeyar (2024) in the South American context, where the conceptions of pre-service teachers regarding decolonization influenced their practice.

Finally, more diverse representations of the world need to be included in geography education. It is important to move beyond the repetitive use of the same regions or countries as examples, as this study has shown. While avoiding a return to traditional regional geography, there

appears to be an unreflective approach in selecting spatial examples, as confirmed by both textbooks and teachers in this study. It is crucial to dismantle these continuities (Naylor et al., 2018), particularly in the representation of Africa (Daley & Murrey, 2022), and to avoid an uncritical and homogenized approach to spatial representations—despite the significant shift away from regional geography. To promote decolonization in geography it is essential to incorporate Indigenous perspectives and knowledge (Laing, 2021; de Leeuw & Hunt, 2018) as well as voices from marginalized groups, such as critical feminist, queer, and anti-racist perspectives (Peake & Sheppard, 2014). This would ensure that knowledge production is not dominated by white/non-Indigenous voices but instead reflects a broader, more inclusive spectrum of perspectives.

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6 Zusammenfassung

Basierend auf dem Ziel des UMRdivers-Projekts, Lehramtsstudierende auf den Umgang mit vielfältigen Klassenzimmern vorzubereiten (Zentrum für Lehrkräftebildung Marburg, 2022), zielte meine Arbeit darauf ab, eine potenzielle Spannung im Bereich der Geographie zu untersuchen. Diese Spannung ergibt sich aus den Anforderungen, Diversität zu berücksichtigen (Hessische Lehrpläne, 2021, 2023), und dem Risiko, Stereotype zu reproduzieren, die in den kolonialen Ursprüngen des Faches verwurzelt sind (Radcliffe, 2022). Eine umfassende Analyse aller lizensierten hessischen Geographieschulbücher (Paper 1+2) zeigte sowohl eine Homogenisierung des afrikanischen Kontinents als auch eine allgemeine Verzerrung, einen Bias, in der Darstellung der Welt. Durch das Interviewen einer repräsentativen Gruppe Deutscher Geographielehrkräfte wurde bestätigt, dass Stereotypisierung im Geographieunterricht eine Rolle spielt. Es ergab sich, dass Stereotype vor allem im Kontext Afrikas üblich im Geographieutnerricht sind. Die zentralen Ergebnisse der drei Studien werden nun zusammengefasst und ihre Zusammenhänge verdeutlicht.

Die Ergebnisse der ersten Studie zur allgemeinen Darstellung von Diversität im geographischen Unterricht sind auffällig: Während alle Diversitätsdimensionen in den Geographieschulbüchern abgebildet werden, unterscheiden sie sich erheblich in ihrer Häufigkeit. Externe Dimensionen sind insgesamt wesentlich häufiger vertreten als interne, insbesondere der ökonomische Status, der soziale Status und der Bildungshintergrund. Die Schulbuchanalyse zeigt außerdem eine Abhängigkeit zwischen der Klassenstufe des Schulbuches sowie dem Thema und der Repräsentation von Diversitätsdimensionen. So lassen sich die meisten Dimensionen in den Schulbüchern der Mittelstufe (Klasse 7+8) identifizieren. In den Geographie-Schulbüchern der Unterstufe (Klasse 5+6) werden hingegen die wenigsten Dimensionen abgebildet. Die Schulbücher der Oberstufe liegen mit ihrer Darstellung zwischen den beiden Stufen. Die Abbildung von Diversitätsdimensionen variiert je nach thematischem Schwerpunkt ebenfalls deutlich. Mit Abstand am häufigsten werden Diversitätsdimensionen im Inhaltsfeld “Bevölkerungsgeographie” abgebildet, dass bereits 39% aller identifizierten Dimensionen abdeckt. Danach folgen “Globalisierung” mit 15% und in “Länder und Kontinente” mit 14%.

Unterscheidet sich die Darstellung der Dimensionen auch nach Ländern und Kontinenten? Diese Frage konnte durch die Berechnung der absoluten Häufigkeiten im Kontext von a) Kontinenten und b) Ländern beantwortet werden. Eine Anamorphose der Welt, skaliert nach der absoluten Anzahl an Nennungen von Diversitätsdimensionen im Kontext von Kontinenten (a), visualisiert auffällige Ergebnisse: Sie zeigt Europa und Afrika unverhältnismäßig groß, während Asien und Ozeanien kaum sichtbar sind. Auf Länderebene (b) jedoch verändert sich das Bild deutlich: Nordamerika und Asien dominieren die Karte zusammen mit Europa (unverändert), und Afrika erscheint auffallend klein. Da diese Ergebnisse immer noch eine Aufsummierung aller Dimensionen

darstellt, stellte sich die Frage, ob es Unterschiede in den Verbindungen zwischen den einzelnen Dimensionen gibt, wenn diese nach Kontinenten kategorisiert werden. Die Netzwerkanalyse, die dieses Co-Auftreten von Dimensionen innerhalb einer Kodiereinheit statistisch berechnete, zeigt folgende Anomalien in der Darstellung der Kontinente:

- **Europa & Asien**: Höchste Zentralität haben der ökonomische und soziale Status sowie die nationale Herkunft. Von mittlerer Zentralität sind der Bildungshintergrund, die Ethnizität und das Alter. Alle anderen Dimensionen sind von niedriger Zentralität.
- **Nord- & Südamerika**: Der ökonomische und soziale Status, die nationale Herkunft und die Ethnizität sind gleichermaßen von hoher Zentralität. Alle anderen Dimensionen haben eine niedrigere Zentralität. Im nordamerikanischen Netzwerk ist auch die Dimension "Race" von hoher Zentralität, was damit eine Ausnahme darstellt.
- **Afrika**: Das afrikanische Netzwerk unterscheidet sich stark von den anderen Kontinenten, da ausschließlich der ökonomische Status eine hohe Zentralität aufweist und alle anderen Dimensionen mehr oder weniger mit diesem verbunden sind. Darüber hinaus hat die Dimension Behinderung im afrikanischen Netzwerk eine höhere Zentralität als in allen anderen Netzwerken.

In der dritten Studie haben alle befragten Geographielehrkräfte bestätigt, dass Stereotypisierung eine Rolle im Geographieunterricht spielt. Hierbei gab es ein auffälliges Ergebnis: Die von den Lehrkräften genannten Beispiele zeigten nur wenig Überschneidung, mit einer Ausnahme – den Kontinenten. Über die Hälfte der Lehrkräfte gab an, dass Stereotype häufig im Zusammenhang mit Afrika im Geographieunterricht auftreten. Dies war der einzige Konsens unter den Lehrkräften, der wie folgt erklärt wurde: Die komplexen Themen der Geographie erfordern didaktische Vereinfachungen. Einige Lehrkräfte bezeichneten dies explizit als Herausforderung – die Balance zwischen einem Schwarz-Weiß-Denken (und damit Stereotypisierung) und der notwendigen Reduktion von Komplexität ist schwierig. Diese fachspezifische Herausforderung war jedoch die Ausnahme. Der primäre Konsens der Lehrkräfte bezog sich auf strukturelle Herausforderungen, insbesondere Zeitmangel. Dieser Zeitmangel verhindert eine tiefere Auseinandersetzung mit inhaltlichen Herausforderungen und kann somit zur Verstärkung von Stereotypen beitragen. Wie gehen Lehrkräfte damit um, wenn Stereotype im Unterricht reproduziert werden? Sie verlassen sich hauptsächlich auf hochgradig individualisierte Strategien. Ein wiederkehrendes Thema dieser Strategien war die Kategorie „Dialog und Reflexion“ – eine Kategorie, die durch vage Aussagen wie „ansprechen“, „hinterfragen“ oder „aufbrechen“ gekennzeichnet ist, wobei unklar bleibt, was diese Strategien konkret beinhalten.

Zusammenfassend scheint die Komplexitätsreduktion eine grundlegende Herausforderung im Geographieunterricht zu sein. Strukturelle Probleme wie Zeitmangel, unzureichende Materialien und

mangelnde Ausbildung in der Lehrerbildung können dann zu Stereotypisierung führen. Diese Herausforderung wird besonders problematisch, wenn keine klaren und professionellen Strategien zur Bewältigung dieses Probleme vorhanden sind.

Die Ergebnisse aller drei Studien ergeben folgende Hauptbefunde:

1. Der Geographieunterricht vermittelt insgesamt ein stark verzerrtes Weltbild, das unzureichend ist und weder die Diversität noch die Realität der (vielfältigen) Schülerinnen und Schüler widerspiegelt. Stattdessen kann die Präsentation von Identitäten in homogenisierter und voreingenommener Weise in Lehrmaterialien zu Stereotypisierung und Diskriminierung von Schülerinnen und Schülern führen, wie auch andere Forschende betont haben (Devine et al., 2012; Eagly & Koenig, 2021).
2. Die befragten Lehrkräfte berichteten einstimmig über Stereotypisierung im Geographieunterricht. Während die genannten Beispiele größtenteils individuell waren, bestand ein breiter Konsens hinsichtlich des Stereotyps „Afrika“. Die in den Schulbüchern suggerierten Stereotype scheinen sich zumindest in dieser Stichprobe widerzuspiegeln, die in Bezug auf Alter, Bundesland, Zweitfach, Schulform und Unterrichtserfahrung sehr divers war.

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7 Appendix

7.1 Coding framework of P1 and P2 – extended version

Table 7.1: Coding framework of P1 & P2 - extended version.

Main category	**Sub-category**	**Definition**	**Coding rules**	**Code**
Internal dimensions	Race	Race is a socially determined category that has its roots in the notion of biological classification or differentiation of people into subgroups based on phenotypes or physical traits such as, skin color, facial features, personal characteristics, or cultural traits (Banks & McGee Bank, 2016; European Union Agency for Fundamental Rights, 2010; Patton Terry & Anthony Irving, 2010).	Not represented	0
			- Different races by skin color: -black/ colored people/ white/ Indian - skin color (black/ white) - nations, which are indirectly related to skin color (e.g., Hispanics, afro americans; Latino/a/x; Asian)	1
	Gender	Gender is understood as the deeply felt internal and individual experience of each person's sex and other expressions of gender, including dress, language, behaviors, abilities, and interests (Bundesministerium für Unterricht, Kunst und Kultur, 2000; European	Not represented	0
			- gender specific role models - responsibilities of man and women	1

		Union Agency for Fundamental Rights, 2010). Gender refers to socially and psychologically accepted behaviors for males and females in a given society. Expectations regarding gender roles can differ across cultures and subgroups (Banks & McGee Bank, 2016).		
	Sex	Sex means the biological gender of women and men (Bundesministerium für Unterricht, Kunst und Kultur, 2000; Sieverding, 2010).	Not represented	0
			- biological sex (female/ male) is mentioned or arises by content	1
	Ethnicity	Ethnicity refers to group membership determined by genealogy (Patton Terry & Anthony Irving, 2010) ancestry, language, behavior, culture, nationality or religion and are thus characterized by a common background (Bendl et al., 2012; European Union Agency for Fundamental Rights, 2010). Culture, as an aspect of ethnicity, is more accurately conceived as the lifeworld of a social group	Not represented	0
			- representation of culture; ancestry; values & norms; traditions; or language of ethnicities - Ethnicity as a reason for the expression of external dimensions (economic status; educational level; social status) - Transfer to power relations - “Ethnic diversity” is mentioned/ diverse cultures are mentioned	1

		or community characterized by shared patterns of interpretation, norms, values, practices, and habits developed on the basis of shared experiences (Mazziotta et al., 2016). "Ethnicity by contrast, generates a discourse where difference is grounded in cultural and religious features" (Hall, 2000). Culture is thus assigned to the dimension of ethnicity.		
	National Origin	In this work, national origin is understood as citizenship. Nationality is "the legal bond between a person and a state" (European Union Agency for Fundamental Rights, 2010). Thus, "[t]he term 'national origin' (...) may be invoked to refer to a person's former nationality, which he or she may have lost or acquired an additional nationality alongside by naturalization, or to refer to membership in a "nation" within a state" (European Union Agency for Fundamental Rights, 2010). This means a special	Not represented	0
			- Different National origins are named (European; Nigerian; Chinese;…) - National origin as reason for expression of external dimensions - National origin is named directly by “national origin” or by e.g., “refugees” which gives the deduction to a national origin - juxtaposition by "we" and "they" as an indicator that “they” have different national origin than “we”	1

		legal bond between a person or group to the homeland (Hoffmeyer-Zlotnik & Warner, 2019).	- when origin is decisive for a comparison	
	Disablity	"Persons with disabilities include people who have long-term physical, mental, psychological, intellectual or sensory impairments that, in interaction with various barriers, may prevent them from participating fully, effectively and equally in society." (Bundesministerium der Justiz, 2002; United Nations, 2007). “A period of more than six months is considered to be not merely temporary." (Bundesministerium der Justiz, 2002)	Not represented	
			- terms Physical/ mental/ emotional or sensory impairments are mentioned	1= individual disability
			- Social impairments are described in more detail using a specific example by a room sample, e.g., countries and continents. This includes famines, epidemics, child mortality, natural disasters or physical features	2= social disability
External Dimensions	Economic Status	Economic status reflects the individual position in the social hierarchy, whereby this is based on the income situation and general financial situation in the context of the work (Lampert et al., 2013). Related to the analyzed material (textbooks) and the subject (geography),	Not represented	0
			- Low economic status is named directly or indirectly, e.g., economic crisis/ low GDP/ high unemployment - High economic status is named directly, or indirectly, e.g., Economic upswing / prosperity /	1

		this is also applied to the financial situation of regions, or entire countries, and continents.	High GDP / low unemployment /rich - poor continents or countries are mentioned directly or indirectly, e.g., little developed, low standard of living / lower class /poor - rich continents or countries are mentioned directly or indirectly, e.g., highly developed/ high standard of living / upper class - Comparison of different economic statuses related to continents and countries - economic levels are mentioned / described - Economic barriers & limited finances	
	Educational background	Education includes variables such as educational pathways and thus all degrees (Hoffmeyer-Zlotnik & Warner, 2019). Education is a task for society as a whole and should lead to the development of personalities and provide well-trained specialists for the labor market with the aim of keeping a country	Not represented	0
			- directly named and represented by *educational background* - No/low/ high access to education - low/ high educated - undereducated/ qualified workforce; low-skilled/ well-skilled workforce	1

		economically competitive (Bundeszentrale für politische Bildung, 2018). As a variable, education is a key indicator of social inequality (Hoffmeyer-Zlotnik & Warner, 2019).		
	Social Status	Since social status is closely linked to economic status and educational background, including that of the family, and overlaps with these areas, aspects that clearly distinguish this dimension from the others should be specifically included for the sake of separability. Since a concept of social status primarily includes socio-economic factors such as income (Farkas 2022), this aspect is excluded here for better distinction from economic status. Furthermore, social status encompasses a position in the social system, which today is referred to as prestige and defines social status, indicating a specific lifestyle	Not represented	0
			- Social status (also pension or social system) of a person/group of people/countries/continents is mentioned and if applicable assessment of social status - Crime status, security status, population structure, political situation, unemployment rate, social structure, and health issues of countries or continents are named as indirect connections or consequuences of the respective social status. - different life styles as expression of social status - Social issues	1

		(Crompton 2012; Waters and Waters 2015). Since social status can also refer to groups of individuals and even entire countries, it is defined in this context by parameters such as illiteracy, employment rate or unemployment rate, homelessness, and crime rate.		
	Religion	Religion or belief [are] essentially personal and subjective (...) and [need not be] necessarily related to an institutionally established faith (...)" (European Union Agency for Fundamental Rights, 2010).	Not represented	0
			- Religion as a term mentioned - different religions are mentioned (e.g. Hindus, Christians, Muslims, Jews, etc.)	1
	Family background	Family background can be characterized by different components (Geseke & Grinfelds, 2012). For the coding, the following components emerged as relevant through the material review and an inductive approach: Family material resources (family income, educational resources, and social assistance).	Not represented	0
			- directly represented as family origin - indirectly represented, e.g., parental income, parental education level, parental social status or parental origin	1

	Family status	Marital status is defined as legalized cohabitation (Hoffmeyer-Zlotnik & Warner, 2019). It is divided into various legal categories: single, married, married but separated, divorced and widowed (Hoffmeyer-Zlotnik & Warner, 2019). The number of children or childlessness is also counted as "marital status".	Not represented	0
			- family planning, formation, or founding is written about - one-child policy (as a reference to marital status) - family planning is mentioned in connection with other dimensions - mention of children in the context of family (without describing more concrete tasks/meanings of children)	1
	Age	"Age" is defined by the number of years lived. For the operationalization of "age," providing the birth year, ideally supplemented by the birth month, is sufficient (Hoffmeyer-Zlotnik & Warner, 2019). More precisely, a distinction is made between three levels of age: - Biological age (-> body) - Psychological age - Social age (Bendl et al., 2012).	Not represented	0
			- naming or describing certain age groups (also in the form of: children, adults and seniors) and possibly accompanying internal differentiation. - indications that suggest age are named: being young/ old	1

7.1.1 References

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7.2 Codesystem P3

Table 7.2: Codesystem P3.

List of Codes	Frequency
Code system (total)	371
1. Challenges	0
1.1 Teacher training (LuL-Ausbildung)	0
1.1.1 "Practical shock" (from university to school)	3
1.1.2 Constant changes in curriculum during training	1
1.1.3 Limited professional development opportunities, preventing skills expansion	4
1.1.4 University training: Lacks focus on topics in teacher education (e.g., stereotypes), thus no knowledge	7
1.1.4.1 Regarding critical reflection	1
1.2 Students (SuS)	0
1.2.1 Lack of relevance to students' real-world experiences	1
1.3 Teacher	0
1.3.1 Overburdened teachers due to a wide variety of tasks	1
1.3.2 Teachers' hands tied by curricular requirements	1
1.3.3 Teacher behavior & collaboration: No improvement without collaboration	4
1.3.4 Habit & stress limit approaches to stereotyping, lack of awareness	1
1.3.5 High teacher dropout rates	1
1.4 Resources & materials	0
1.4.1 Commercial interests of textbook publishers, no focus on concepts like stereotyping	3

1.4.2 Textbooks are deficient, reproducing stereotypes and one-sided portrayals; diversity not considered	11
1.4.3 Social media generalizations; critical lack of transparency	1
1.4.4 Some textbooks are outdated, as if from the colonial era	1
1.4.5 Publishers are not progressive, they keep producing "the old"	1
1.5 Political & educational policy	5
1.5.1 Conservative and regressive education system, hence no innovations or adaptations	1
1.5.2 No realistic expectation management for teachers; demands cannot be met	1
1.5.3 Low appreciation for geography, limiting opportunities for change; geography must focus on survival	6
1.5.4 Limited hours for geography, no time to cover all topics	5
1.5.5 Curriculum constraints due to a mandatory canon of topics, difficult to cover within the time frame	6
1.5.6 Federalism: Each state follows its own approach	1
1.5.7 Slow implementation process	1
1.5.8 Opaque curriculum development: Who decides? What are decisions based on?	1
1.5.9 Curriculum overloaded by shift from G9 to G8 without content adjustments	2
1.5.10 Senior class course requirements: Geography is not compulsory, limiting content	1
1.6 Content/subject	1
1.6.1 Geography is mainly problem-oriented, leading to negative perceptions of other countries	2
1.6.2 Subject complexity requires reduction, which fosters stereotypes	1

1.7 Structural (school)	0
1.7.1 Material resources (e.g., equipment for field studies): No room for alternative approaches	1
1.7.2 Teachers need more freedom to address and differentiate such topics	1
1.7.3 Diversity is not a core focus in schools, so it is often overlooked	1
1.7.4 Staff shortages prevent focus on issues like stereotyping	3
1.7.5 Limited transfer of research into schools: research findings mostly unimplemented	7
1.7.6. Digitalization: Few media resources available for variety	2
1.7.7 Grading structure (reliance on exams) causes students to focus only on test-related topics	1
1.7.8 Limited individual attention due to large class sizes	1
1.7.9 Time constraints lead to numerous secondary issues	23
1.7.9.1 Lack of project-based teaching, no room for concepts like stereotyping within "normal classes"	3
1.7.9.2 Lack of content foundation, no differentiation	1
1.7.9.3 Suggestions (e.g., on diversity & stereotyping) are often too time-consuming	1
1.7.9.4 Lack of interdisciplinary teaching, limiting perspectives and holistic thinking	1
1.7.9.5 Creativity constrained by time limitations	1
2. Concept: stereotyping	0
2.1 Reasons for stereotyping (inductive)	0
2.1.1 Resources	0
2.1.1.1 Textbooks reproduce stereotypes	1

2.1.2 Teachers (LuL)	0
2.1.2.1 Methodological decision-making level	0
2.1.2.1.1 Content is stereotyped to evoke emotions, showing extreme examples	1
2.1.2.1.2 Stereotypes can be used purposefully, e.g., using images of American people to convey obesity	3
2.1.2.1.3 Case studies can stereotype as assumptions of one individual are extended to entire societies	2
2.1.2.2 Older teachers stereotype more as they don't update materials (+)	1
2.1.3 Educational policy guidelines	0
2.1.3.1 Curriculum-related stereotypes: Many topics are prescribed, and thus must be condensed, risking generalization	5
2.1.4 Geography-specific/content-related	0
2.1.4.1 More stereotypes in higher grades, as younger grades focus more on physical geography with fewer stereotypes	1
2.1.4.2 Stereotypes are necessary to communicate complex ideas	2
2.1.4.3 Stereotyping happens inevitably; everyone has stereotypes, and much is automatic	2
2.1.4.4 Classes rarely focus on individuals, leading to generalizations of societies	1
2.1.4.5 Complexity must be reduced for students; pedagogical reduction is part of the teaching process	13
2.1.4.6 Geography often focuses on problems, which may reduce perceptions of countries if only negative aspects are covered	1
2.1.5 Students (SuS)	0

2.1.5.1 All students have different experiences and knowledge; stereotypes often shaped by experiences	7
2.1.5.2 Students struggle with handling ambivalence	1
2.1.5.3 Students struggle to differentiate cultural, economic, and social perspectives	1
2.1.6 Social/cultural influences	0
2.1.6.1 Foreigners	0
2.1.6.1.1 Low number of foreigners leads to racism	1
2.1.6.1.2 Limited information on other societies leads to generalizations	2
2.1.6.1.3 Foreignness can cause resistance, increasing stereotyping about foreigners	1
2.1.6.2 Self	0
2.1.6.2.1 Everything unrelated to Europe is stereotyped more quickly	2
2.1.6.2.2 Socialization leads to Eurocentrism	4
2.1.6.2.3 Projecting one's own values onto others, generalizing norms and values without differentiation	1
2.1.6.2.4 Cultural identity narrows perspective; own culture seen as normal, others as deviant	6
2.1.6.2.5 Socialization normalizes one's own culture, leading to a narrowed view and generalizations about others	1
2.1.6.2.6 "Our" history leads to assumptions of superiority, leading to stereotyping (world complexity)	1
2.2 Stereotypes in geography lessons? (examples) (deductive)	1
2.2.1 Country groups	4

2.2.1.1 Developing countries	4
2.2.1.2 Global South	1
2.2.2 Students' backgrounds	1
2.2.2.1 Orient	1
2.2.2.2 "White rescuer"	1
2.2.2.3 Syria	2
2.2.2.4 Ukraine/Russia	1
2.2.2.5 Arabic world	2
2.2.2.6 Parents	2
2.2.2.7 Social & financial background -> influences attitudes on topics	1
2.2.2.8 Ethnicity, race, religion, and national origin	1
2.2.3 Continents	2
2.2.3.1 Africa	9
2.2.3.2 Asia	3
2.2.3.3 North America	2
2.2.4 Countries	0
2.2.4.1 Zimbabwe	1
2.2.4.2 Bangladesh	1
2.2.4.3 India	2
2.2.4.4 Alaska	1
2.2.4.5 China	2
2.2.4.6 Germany	2
2.2.4.7 Nigeria	2
2.2.4.8 Russia	2

2.2.4.9 USA	3
2.2.5 Thematic subfields	0
2.2.5.1 Local area: social segregation	1
2.2.5.2 Migration	1
2.2.5.3 Economy	1
2.2.5.4 Sustainability	1
2.2.5.5 Poverty	1
2.2.5.6 Exploitation	1
2.2.5.7 Equal opportunities (Germany)	1
2.2.5.8 Development cooperation	1
2.2.5.9 Birth rate	1
2.2.5.10 Inuit	1
2.2.5.11 Agriculture	1
2.2.5.12 Rainforest	1
2.2.5.13 Religion	1
2.2.5.14 Tourism/vacation planning	1
2.2.5.15 Physical geography	1
2.2.5.16 Resources/fast fashion	2
2.2.5.17 Orientation (compass)	1
2.3 Strategies in handling (deductive)	0
2.3.1 Perspective change	3
2.3.1.1 Considering people's wishes & needs	1
2.3.1.2 Through personal experiences of emigration (e.g., migration)	1

2.3.1.3 For example, valuable materials = gold/diamonds -> also wood!	1
2.3.2 Cause identification	4
2.3.2.1 Reasons for emigration (conditions, roleplay)	1
2.3.2.2 Reasons for facts	1
2.3.3 Student-oriented	0
2.3.3.1 Teaching approaches to deal with stereotypes	1
2.3.3.2 Cognitive dissonance	1
2.3.3.3 Checking prejudices at the beginning of a topic	1
2.3.3.4 Provoking & confronting students	3
2.3.3.5 Raising awareness (racism)	4
2.3.4 Teacher professionalism	0
2.3.4.1 Teachers need awareness to avoid perpetuating stereotypes themselves	1
2.3.4.2 Connection of university and professional perspectives to reduce stereotyping through knowledge & experience	1
2.3.4.5 Competence in arguing with knowledge and reasoning to reduce stereotypes	1
2.3.5 Teaching methods	0
2.3.5.1 Concreteness: Bring something tangible to mitigate stereotypes for lasting memory	1
2.3.5.2 Using various media for different perspectives to counter stereotypes	5
2.3.5.3 Drawing ideas on a topic to elicit and then systematically address stereotypes	3
2.3.5.4 Use digital media, like virtual city tours, to broaden perspectives; example: U.S. city ghettos	1

2.3.5.5 Avoid stereotypes through "mystery" techniques	1
2.3.5.6 Life line diagrams	1
2.3.6 Outside of class	0
2.3.6.1 Literature recommendations to colleagues, e.g., books that explain stereotyping	1
2.3.6.2 Prepare to avoid stereotypes during lesson planning	1
2.3.7 Dialogue & reflection	0
2.3.7.1 Clarifying misconceptions through surveys	1
2.3.7.2 Creating neutrality to dissolve stereotypical views	2
2.3.7.3 Consider author intentions, e.g., cartoons: What is the author highlighting through exaggeration? Avoid misinterpretation	1
2.3.7.4 Addressing stereotypes through class discussions	11
2.3.7.5 Uncover and eliminate stereotypes through reflection	1
2.3.7.6 Conscious vs. unconscious approaches to stereotypes	1
2.3.7.7 Addressing & differentiating when stereotypes arise	1
2.3.7.8 Recognizing and resolving stereotypes when they arise	1
2.3.7.9 Talking about stereotypes can help	1
2.3.8 Reduction vs. complexity	0
2.3.8.1 Promote level 3 requirements and allow differentiation (+)	3
2.3.8.2 Create complexity to counter stereotypes	2
2.3.8.3 Understand complex spatial factors to counteract stereotyping	1
2.3.8.4 Multiperspectivity and diversity to avoid stereotypes	2

2.3.9 Working based on facts, can contextualize stereotypical assumptions	7
2.3.10 Cultural approaches	0
2.3.10.1 Pay attention to language choice to directly avoid stereotypes	1
2.3.10.2 Consider cultural aspects to avoid one-sided economic perspectives (distinguish between countries)	1

7.3 Hilfsmittel

Table 7.3: Hilfsmittel.

KI-basiertes Hilfsmittel	**Einsatzform**	**Anmerkungen**
Grammarly	Englische Grammatik	Automatische Vorschläge zur Optimierung englischer Grammatik/ Rechtschreibung in word
Chat GPT (OpenAI)	- Übersetzer - Zusammenfassungen von Literatur beim Sichten - Übersetzung von Kategoriesystem P3 - Die Summary im Rahmen ins Deutsche übersetzt - Literaturverzeichnis Paper 1 nach APA 7th. Edition (English) formatiert	- Eigen formulierte Sätze/ Absätze ins englische übersetzt; dann aber viel angepasst - Meine englischen Texte auf Grammatik und Rechtschreibung überprüfen lassen - Teilweise gelesene Literatur (z.B. Paper) zusammenfassen lassen, um einen Überblick zu bekommen. - Meine gebildeten Kategorien und dessen eigenständig formulierte Beschreibungen in P3 (Lehrkräfteinterviews) wurden ins Englische übersetzt. Das habe ich geprüft und angepasst. - Um dem Wortlaut meiner eigenstänig formulierten Summary bei einer Übersetzung ins Deutsche genau treu zu bleiben, habe ich die Summary ins Deutsche übersetzen lassen und anschließend aber stark angepasst. - Die LV´s hatten unterschiedliche Zitationsstile und wurden so angepasst und automatisch formatiert, um die Fehlerquelle zu minimieren.
MAXQDA KI Assistant	- Erstellung neuer Kategorien im Material	- Die von der KI erstellten Kategorien wurden überprüft und bei Bedarf angepasst - Diente vor allem dem Brainstorming

Pica AI	- Erhöhung der Bildqualität der Abbildungen 3.5 A-E	- Ausgegebene Abbildungen aus Rstudio hatten eine verminderten Qualität, stark verpixelt

Erklärung

Hiermit versichere ich, dass ich meine vorliegende Dissertation

Unveiling Diversity and Challenging Stereotypes: A Critical Examination of Geography Education

selbstständig, ohne unerlaubte Hilfe Dritter angefertigt und andere als die in der Dissertation angegebenen Hilfsmittel nicht benutzt habe.

Alle Stellen, die wörtlich oder sinngemäß aus veröffentlichten oder unveröffentlichten Schriften entnommen sind, habe ich als solche kenntlich gemacht. Dritte waren an der inhaltlich-materiellen Erstellung der Dissertation nicht beteiligt; insbesondere habe ich hierfür nicht die Hilfe eines Promotionsberaters in Anspruch genommen.

Kein Teil meiner Dissertation wurde und wird in einem anderen Promotions- oder Habilitationsverfahren verwendet und hat noch keinen sonstigen Prüfungszwecken gedient.

Mit dem Einsatz von Software zur Erkennung von Plagiaten bin ich einverstanden.

Von generativer KI erstellte Sätze, Textblöcke, Graphiken und Tabellen habe ich im Text der Dissertation durch Zitation an entsprechender Stelle kenntlich gemacht.

Die von mir genutzten KI-Tools sind im Verzeichnis „Hilfsmittel“ tabellarisch aufgeführt.

Vorname, Nachname:

_____

Datum, Unterschrift

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