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The Missing Pieces of Disaster Education: A focus on Policy, Elementary Grade Geography Curriculum and Assessment

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Abstract
The purpose of this study was to assess the compatibility of the Balochistan geography textbook's elementary grade curriculum with national education policy standards related to mainstreaming Disaster risk reduction and risk management in curriculum. The study used an exploratory research design with content analysis and a focus on text in context reference. The qualitative content analysis revealed that students' learning outcomes and textbook contents were not in line with formative assessment activities in textbooks. The curriculum offered relatively some conceptual knowledge, whereas the assessment exercises skipped disaster-related knowledge from the sections. The horizontal alignment of SLOs related to DRR did not correspond with the content throughout grades, and some of the concepts were frequently repeated. The vertical alignment of curriculum, textbooks, and assessment with policy recommendations was also lacking. The textbook exercises did not correspond to the assessment needs mentioned in students learning outcomes, as evidenced by the vertical alignment in all three textbooks, and the horizontal alignment of DRR-related SLOs was not aligned with content. In formative assessment, certain terminology was ruled improper for assessment purposes. The evaluation exercise questions are likewise subjective in terms of wording. Overall, the curriculum is not consistent with policy recommendations. The study suggests altering the curriculum in accordance with policy standards, as well as adopting a textbook-driven approach to make the changes simpler to execute.

Keywords: Curriculum Alignment, Formative assessment; Disaster risk reduction and curriculum, Education policy, Textbook driven approach.

Background of the study:
Education plays a vital role in shaping an individual's knowledge, skills and attributes for settlement in society in general and specifically in the situations of disasters or emergencies. Education could be a continuous planning, preparation and transforming activity and the foundation of student's prospects, which offers students skills, knowledge and attitude to provide a more successful future for their communities and themselves. Children endure a lot during conflict and forced relocation (Machel, 2001; Talbot, 2013). In the event of a disaster, usually children are the most vulnerable to risk, as they are more exposed to being killed or injured during disasters than adults (Lawler & Patel, 2012). Children's specific vulnerability has been already identified in the literature, for example during the October 2005 Earthquake 16,000 children died in schools due to collapsed buildings, Another tragic example of why more needs to be done to safeguard our children before disasters strike is the mudslide on Leyte Island in the Philippines, where more than 200 school children were buried alive (UNISDR, 2006-2007).

Education is also seen as an essential human Rights under international and regional human rights presented in several global documentations (McCowan, 2013). According to Machado (2012) the nation has to overhaul its education strategy and reconsider the targets and reasons of the education provided to its people. Education has to be coordinated towards the strengthening of its people, it must be equipped to produce a generation of "doers and givers" (Nusrat & Jamil, 2007). In order to bring the community out of crises and lessen the impacts of trauma, education is essential similarly disaster management includes and prioritizes preparedness (Hatthakit & Chaowalit, 2011). One of the key parties in charge of fostering preparedness is the school. Schools play a number of strategic roles in disaster preparedness in addition to being a source of knowledge, dissemination of DRR knowledge serve as an active learning opportunity for communities, offering advice on how to prepare for them and what to do both during and after they strike. So, when it comes to enhancing public disaster preparedness, school readiness is crucial (Takahashi et al., 2015).

The inclusion of the "No child left Behind Act" SDG goals (Goal 04, 10, 13) and Hyogo Framework (UNISDR reports on Hyogo framework for action implementation," 2013) Sendai Framework for DRR 2015-2030 (UNISDR, 2015) put more

accountability on the Education system and interlinked education as a sustainable solution. COVID-19 pandemics declaration as a Disaster and educational activities alteration from physical classrooms to the online system, and dependency on technology during national lockdown validate the importance of EiE (Landa et al., 2021). Schools should play a key role in education for resilience, contributing to the formation of citizens with high levels of sociability, cooperation in networks, communication skills, and abilities to act efficiently. The integration of disaster risk reduction (DRR) into the formal education system and the curriculum has been accepted as a strategy to foster knowledge and understanding of disaster risks. There has been some initial progress reported worldwide mostly in the countries affected by the disaster like the Indonesian initiative in DRR integration into the school curricula. in Indonesia where the integration of DRR through the curriculum at the national level, and through the policy level to local implementation in schools was implemented, especially the integration of DRR knowledge into the science curriculum or related topics, such as climate change. Since climate change is the driving force to increase the probability of disasters such as forest fires. The disaster generates economic losses as well as impairing the health of the people at a broader level (Agung et al., 2014).In this perspective, the system composed of teachers, professionals, and students should recognize, value, and promote resilience-promoting strategies by providing opportunities for educational communities to deal with adverse and stressful situations, such as those related to the preparation for disasters and to the management of emergencies caused by both anthropogenic accidents and natural disasters (Carvalho & Leitão, 2015).School is possibly one of the best places to reach the goal of promoting knowledge of DRR (Oktari et al., 2015).

The DRR integration into curricula needs appropriate support from the school management, especially teachers. However, teachers' knowledge related to DRR remains a problem and definitely a hindrance in the implementation of DRR (Jaffar et al., 2024) recommend that educational methodologies, school management, and social organization all play important roles in disaster education. The problem can be minimized by providing adequate training and guidelines through this effort the implementation of DRR would be easier. The teachers are in view that the combination of Disaster knowledge with climate change would benefit students (UNISDR, 2015). Further Nikku et al. (2006) proved that involving kids in the stages of disaster preparation, response, recovery, and relief can increase community's sense of ownership and long-term viability of DRR programs. Several research studies have proved that the negative impact of the disaster and the reduction not only depended on the frequency and the intensity, but also depended on the response of the society, adaptation, and coping mechanism (UNISDR, 2005). The sensible retort towards disaster through the capacity of coping strategy of society is very important. Different groups respond differently to the same disaster or any climatic change (Gaillard et al., 2008; Kohn et al., 2012; Lindell et al., 2009). The possible reason could be the power decision-making, responsible attitude, and the cognition level of that specific community (Becker et al., 2017; Castañeda et al., 2020; Frankenberg et al., 2013; Hung, 2018).

Curriculum and textbooks are guidelines for schools that follow educational goals and objectives. For disaster reduction and prevention, infusion in textbook acknowledge DRR as priority. however, it is not only way of learning DRR. A formal school curriculum is still considered the most effective way to increase people's literacy or awareness. Student-centered learning (Direct learning) makes students aware of potential disasters and their mitigation efforts (Artvinli, 2010; Shaw et al., 2009). Researches demonstrate that, the majority of the lessons focused in the curriculum was on what we should do in the event of a disaster. This is tacit knowledge that participants acquired through experience and expressed through their actions and attitudes (Nonaka & Nishiguchi, 2001) Furthermore, they can share this knowledge with their families and the larger community in their surroundings (Lamina, 2017). Similarly, the research verified the role of education in capacity building of humans. Learning and education are the most powerful agents of change in society for increasing human capacity (Hanifah et al., 2019). In parallel to textbooks and curriculum, the instructional strategies and teacher personal experience related to handling any disaster, attending any seminar, and training add value during planning and delivering the lessons related to DRR. A designed curriculum related to disaster risk reduction and disaster risk Management for teacher education and professional development plan with refresher exercises were strongly recommend (Jaffar et al., 2023). Disaster experience correlates with disaster awareness, in addition to education. People who have been exposed to a disaster are more likely to engage in disaster-related thoughts, conversations, and behaviors and discussions (Becker et al., 2017; Hoffmann & Muttarak, 2017; Tekeli-Yeşil et al., 2010).

The alignment of curriculum and text book is very important to adjusted according to the vertical and horizontal elements. Just like the alignment of education system is in between policy, content, assessment, teaching strategies and students achievement, same as the understudied objective focused the direction from the Pakistan National Educational Policy 2009, The focus on curriculum alignment has shifted as a result of increased accountability and the introduction of state standards. Since then, the alignment has centered on the three components of content, instruction, and assessment (Pankratz & Petrosko, 2000). The degree to which an assessment fits the associated content requirements for a subject area at a certain grade level is known as horizontal alignment (Porter, 2002) The techniques for proving that evaluations and standards are in alignment and are well aligned, they must reflect the depth and breadth of the standards. Making sure of horizontal alignment is important for various reasons. Standards and exams that are closely matched create a clear set of expectations for students and teachers, which clarifies the educational system. The assessments serve as a tangible representation of the standards, giving instructors and students a point of reference for their lessons. Teachers may successfully prepare their students for the accountability tests against the standards in the classroom. The evaluation is a reliable source of data if it is aligned to the criteria, too. Validity may be demonstrated by examining how well an evaluation is aligned with the standards. A reliable assessment generates information that may be used to determine a student's proficiency in the subject matter it examines (Ananda, 2003) The capacity of an assessment to produce accurate assessments of student success may also be improved by alignment. One component of an educational system is represented by standards and assessments. Curriculum, textbook content, stakeholder

viewpoints (such those of parents), classroom teaching, and student accomplishment outcomes are some other components of the educational system (Porter, 2002). Vertical alignment can take place at both general and focused levels of a system of education. Teachers design classroom level instruction in a way that adheres to the standards when standards-based accountability examinations are implemented. In order to represent the logical, consistent sequence for teaching the information in a subject area from one grade level to the next, the standards and assessments themselves must be vertically aligned with one another. Study will be helpful for teachers, curriculum and textbook developers for their guidance related to importance of vertical and horizontal alignment for associating with assessment needs, revision and development of curriculum.

Research Objective

1.To explore the alignment between curriculum and textbook of geography regarding disaster risk reduction education.

Research Question

1.What was the alignment between curriculum and textbooks of geography regarding disaster risk reduction education?

Methodology

To explore the alignment between curriculum and textbook of geography, Disaster risk related terminologies was identified from UNISDR, INEE. In an analysis of textbooks of Grades VI-VIII, the terminologies were further expanded to include the synonyms for operationalization, as Merchant (2015) suggest that some of the terms that need to be used for the purposes of the study's objectives should be operationalized. To further operationalize the terms earthquakes, landslides, tsunamis, and volcanic activity were clubbed under boarder concept of geophysical hazards. Other types include hydrological (avalanches and floods), climatological (extreme heat, drought, and wildfires), meteorological (cyclones and storms/wave surges), and biological (disease epidemics and insect/animal plagues) (IFRC, 2021). Further explanations of the DRR terms mentioned above were used to explore the minimum inclusion of DRR in textbooks. All of these terminologies' presentations were evaluated using the text-in-context principle using summative content analysis. In summative content analysis, keywords or other pieces of content are counted and compared, and then the context is interpreted Hsieh and Shannon (2005) explain that, The study of summative content analysis begins with keywords. keywords are identified prior to and during data analysis and are derived from a literature review or the researchers' interests. For interpretation and reference, the text's context was identified and quoted (document, page numbers). The number of times the term was used and mentioned, as well as the interpretation for each context. To Explore the alignment of curriculum and textbook regarding DRR, the selection of the textbook of social studies (Geography) were done on the bases of relevancy and the recommendation mentioned in National education policy further. Since the focus of the objective was related to alignment of curriculum and the text book regarding DRR therefore the concentration was the alignment of SLOs with the content related to DRR and its assessment as explained in figure 1.1.

Reference to Carroll's model of school learning (1963) highlighted that if activities and assessments were more closely matched to the objectives of the lesson that would result in student learning, one might infer evidence of enhanced instruction (Raths, 2002). On the bases of analyses in SLO's and its alignment, the relevancy of the SLO and the content was examined and only those SLO and the content having link with DRR were focused. Due to the selection based on relevancy of the theme the selection of content was also retrenched. Based on analysis model (Figure 3.2), The researchers created the protocol for content analysis. With the help of two curriculum specialists, once the content analysis protocol confirmed. The curriculum's specified (SLOs) were used to examine the textbook's content related to DRR. The discussion and interpretation involves the already developed model. The four guiding questions were mentioned in the content analysis procedure as already figured out in Figure (3.1). To analyze the alignment, guidelines from the policy for SLO development were used for vertical alignment assessment, and horizontal alignment from SLOs to content selection was considered.

Base on dimensions few areas of discussions were identified which are given below.

1. National Education Policy guidelines for DRR integration in Curriculum.
2. Students Learning Outcomes about DRR in curriculum
3. Student learning outcomes addressed through content.
4. Assessment exercises in textbooks related to DRR.

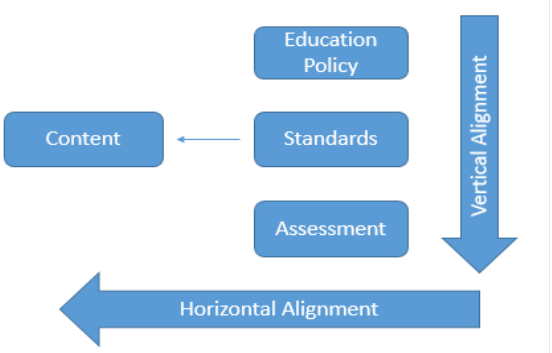

Figure 1.1: Model for Analysis of Curriculum Alignment

Curriculum Alignment

1. The analysis of the alignment was made horizontally by considering students learning outcome (SLOs) and textbook content alignment and vertically by following national education policy guidelines to SLOs and assessment of activities (image 1.1). From the analysis of Grade VI textbook alignment, it was found that, The assessment of the concept of DRR in the textbook includes explaining human interaction and reflecting the benefits of forests to human life. The exercise given in the textbooks were not aligned with the needs of assessment as compared to the content. The content of the textbook provides more knowledge and concept as compared to the assessment exercises. Moreover, the horizontal alignment of SLO related to DRR was not aligned to content and similarly, the vertical alignment of recommendation of policy with SLOs to assessment was not aligned.
2. The SLO of the DRR-related unit were specifically addressed to the DRR concept in the VII textbook. Some of the information was repeated as an extension of the unit's subject matter; for example, the concept of tectonic plate arrangement and faults was the same. The content was also updated to include another aspect of volcanism as the earthquake's cause in same grade. The concept places a lot of emphasis on understanding the cause, but the content omitted the element of earthquake prevention. The text of the examples in the units was provided to provide knowledge in the context of risk and disaster, which was ultimately about DRR. DRR was found to be indirectly integrated in the unit where the examples directly induced the idea of DRR. Consequently, prior to providing the exercise assessment questions, key points from the chapters were built upon disasters. All of the information provided in the chapter's key points was related to disaster. The assessment activities given after the chapter directly assess knowledge of the chapter's content. The assessment includes response selection and response construction related questions. The alignment of SLOs with content was addressed by SLOs and with assessment; however, content related to trauma management and disaster response were lacking in the curriculum and in the textbook contents.
3. In curriculum of grade VIII, relatively more content and SLOs were added associated to DRR directly and indirectly. In a vertical alignment of grades, the VIII curriculum includes more DRR related SLOs that reflect an impression of with in grades strong horizontal alignment among grade contents and SLOs. However, by considering the framework of analysis, no vertical alignment from policy guidelines to SLOs and to assessment was found. The unit "Natural disasters" SLOs concentrate on DRR and DRM techniques to deal with and respond to disasters. However, when the content was compared to the SLO, it was found that the text of the unit placed more emphasis on knowledge and prevention than management and response mechanisms. Similarly, At the end of the units, there was an assessment exercise that includes both response construction questions and response selection questions. However, some questions' wording was deemed inappropriate for assessment purposes. That was "Which areas have experienced landslides in Pakistan?" , "Give three advantages of cyclones" , "What is natural disasters? Which one occurs most frequently and which one is most dangerous? Give examples"The three questions from the assessment exercise examples above, the questions' wording, "experienced landslides," "advantages of cyclones," and "most frequent and most dangerous" were unclear and inappropriate. Additionally, the findings show that the assessment exercise questions were having subjectivity in language.

Discussion and Recommendation

The textbook's assessment of the DRR concept includes an explanation of human interaction and a discussion of the advantages of forests for human life. When compared to the content, the exercises provided in the textbooks were not in line with the requirements of assessment and policy guidelines. In comparison to the assessment exercises and the textbook content, the content offers knowledge and concepts about geographical hazard and policy focus on DRR integration for preparedness, response and trauma management aspect. Additionally, neither the vertical alignment of the recommendation of Policy with SLOs to assessment nor the horizontal alignment of the SLO related to DRR are aligned with the Content. When we say that an instructional policy supports curricula, standards, and assessments, we mean that each of these three key components are in coordination. There has also been a related focus on ensuring that these supports are coordinated with one another and mutually reinforcing in order to improve the quality of instruction and, in turn, improve student outcomes (Cohen-Vogel et al., 2020; Little, 2017; Whitaker et al., 2022).

The focus of the social studies textbook and geography section for grade VI was to inform students about the hazards of earthquakes and the factors that contribute to their occurrence. Second, the idea of volcanism was indirectly discussed, which gives the student insight into the possibility of danger from the eruption of hot magma and encourages them to contrast their knowledge with real-world examples. Beginning with the concept of disaster in geography education and disaster risk reduction education, studies of the relationship between geography and disaster education have developed (Lateh & Ahmad, 2011).Disaster management considered as a result of disaster knowledge and disaster prevention, related to an overall understanding of the disaster, its prevention, effects, and associated potential hazards surrounding disaster-hit areas. One of the essential elements of crisis management was a thorough analysis of the effects generated and their cost (Jaffar et al., 2023). Although the textbook's content had nothing to do with disaster management directly, however the knowledge and prevention was accepted as counter part of disaster management and the text and context helped readers form ideas and learn about the risks associated with disasters. Jaffar et al., (2023) confirm that researchers have recognized the need for disaster education at the classroom level. Disaster risk management and disaster risk reduction-related content must have a place in the curriculum alignment, both horizontally and vertically. Since disaster education may have a major role in the long-term establishment of a culture that reduces disasters.

In a similar vein, An accurate assessment of the impacts will be crucial to develop preventive measures and response program that will enable effective holistic management, which can help to lessen the severity or even prevent impacts in the event of

future crises (Laugé et al., 2013) Gouramanis and Morales Ramirez (2021) support the inclusion of disaster knowledge and Sandai framework tool in curriculum in this way, The occurrence of natural disasters in their environment requires attention from a young age. To improve knowledge of natural hazards and overcome this, a pedagogical tool such as a Sendai framework for disaster reduction is required. Students must learn about geological phenomena in order to comprehend the dynamics of the lithosphere and how it affects life. A few examples include the characteristics of the earth's layers, the tectonism process and its effects on life, volcanism process and its effects on life, and seismic process and its effects on life. The social studies textbook for grade VII contains DRR-relevant content that was pertinent to knowledge, prevention, and the effects of these disasters. Adiyoso (2018) approve that, it's critical in disaster management to provide students with disaster knowledge. Less of the identified DRR-related terminology was used to investigate DRR responsiveness in the textbook, a continuation of the analysis of geography curriculum as compared to the previous grade more emphasized on geographical, hydrological, metrological and climatological hazards. So, the DRR responsiveness was more broadly focused in the grade VII textbook of geography as compared to grade VI textbook. That means the horizontal alignment of the content related to DRR/DRM was arranged in a sequence carrying primary-level to secondary-level content in grade VI and Grade VII. From the analysis, it was also found that the content of geography grade VII was more focused on the causes and effects of disasters and the analysis of cost and effect leads to disaster information and mitigation. As a result, a comprehensive review of the impacts generated and their related costs is a key element of crisis management. In the VII textbook, the SLO of the DRR-related unit were specifically addressed to the DRR concept. Some of the information was repeated as an extension of the subject matter of the unit, such as the concept of tectonic plate arrangement and faults. The content has also been updated to include another aspect of volcanism as the cause of the earthquake.

The concept emphasizes understanding the cause, but the content leaves out the element of earthquake prevention. However, if only disaster comprehension is included, strong content and relevant assessment will be required to check the reaeration argue on significance of strong pedagogical content knowledge (PCK). To advance students' understanding of a concept, subject, or discipline, teachers need a solid PCK, to develop a deeper understanding of a subject, geography teachers with relational content knowledge must be open to students' expressions of their understanding of the topic or concept. They must then combine this with their pedagogical perceptions and knowledge. The unit assessment includes testing of understanding of the chapter's subject matter through response selection. Which was insufficient to assess the understanding further both the curriculum and the content lacked material on trauma management and disaster response.

The eighth-grade social studies textbook offers a thorough response as compare to previous grades to DRR. Natural hazards and disaster occurrences, such as geographic, metrological, hydrological, climatological, and environmental catastrophes, were discussed in detail. The information includes the safety measures required in disaster situations and potential hazard of additional environmental risks that following a disaster was also emphasized. Young Children are more adaptive towards learning as compare to the adults, inclusion of DRR related material in curriculum is an attempt to teach children as well as community on new disaster knowledge since the children convey the knowledge they gained through school too their homes and community. Gopnik et al. (2015) and Izadkhah and Hosseini (2005) support the argument in this way, One of the best ways to prepare a community for disasters is through education. Adults are thought to be less open to new ideas than children. Inclusion of Safety measures during teaching and learning extend the understanding on risk awareness and prevention. Starting with educating the next generation, this can then be extended to include their families as a larger community. The formal school curriculum can include a variety of topics and materials on health, safety, and hazards. All of these initiatives are intended to increase children's knowledge and preparedness and teach them how to respond in the event of a disaster (Marshall, 2020; Twigg, 2004). The disaster management model serves as the foundation for disaster management planning. This model has four stages: reduction, preparedness, response, and recovery. however, disaster prevention has a vibrant role in disaster response. Preventive measures such as changes in building processes or land use planning could be implemented through risk assessment. During the planning phase, an analysis of the effects of previous disasters leads to the improvement of response programs by assigning priorities, allocating resources, and training responders. All previously developed programs and training improve managers' learning about the consequences of a natural disaster over time, reducing the generation of indirect impacts (Laugé et al., 2013). In addition to natural disasters, environmental risks were thoroughly covered to highlight population risks in the future that could result in a major catastrophe. Laugé et al. (2013) researched that, the ability to carry out efficient holistic management through the development of preventive measures and response programs is dependent on accurate impact estimation, which helps to mitigate or even avoid impacts in the face of future crises. Mitigation is a strategy to lessen the severity of loss of life and property, while prevention is a defensive tactic to stay safe. The textbook's discussion of prevention and mitigation tactics went hand in hand. Some DRR experts prefer the word "prevention" to "mitigation." In recent years, remarkable advances in disaster prevention and mitigation have been made, significantly reducing the associated risk and loss (Tang et al., 2019) similarly, various new materials, structures, and methods, as well as disaster prevention and control capabilities, have been adopted (Xue et al., 2021).In elementary school textbooks, there was relatively a coherent horizontal alignment of DRR-related content. In upper elementary geography textbooks, DRR content was organized from basic to advanced, beginning with knowledge and progressing to understanding and prevention and mitigation.

Relatively more content and SLOs related to DRR, both directly and indirectly, were added to the eighth-grade curriculum. Since the VIII includes more DRR-related SLOs that reflect an impression of with in grades, there was a strong horizontal alignment among grade contents and SLOs in the vertical alignment of grades. Squires verified that when a curriculum is aligned, it means that the instructional process takes into account how assessments and standards are covered. Students must learn the material covered in the test, otherwise they won't have the chance to comprehend it. However, taking into account

the analytical framework, no vertical alignment between policy guidelines, SLOs, and assessment was found. Vertical alignment ensures that instruction focuses on the intersection of content standards and student needs. In curricula with strong vertical alignment, redundancy is less common, and the curriculum arrangement is demanding and difficult. (Fisher, 2008).As the unit heading already indicates, the main unit of the grade book was titled "Natural disasters," and the SLOs for this unit were focused on DRR and DRM strategies for dealing with and responding to disasters. Though it was discovered that the text of the unit placed more emphasis on knowledge and prevention than management and response mechanisms. Similar to this, there was an assessment exercise at the end of the unit that included both questions about response construction and questions about response selection. However, the wording of some questions was deemed unsuitable for assessment. These are "Which areas in Pakistan have experienced landslides?" "Give three advantages of cyclones." "What are natural disasters? Which is the most common and which is the most dangerous? Give instances. The words "experienced landslides," "advantages of cyclones," and "most frequent and most dangerous" were used in three of the assessment exercise examples above, but these words were unclear and inappropriate. The results also demonstrate the subjectivity of the assessment exercise questions whereas the alignment and meaningful assessment are fruitful in installing competencies in students. Similarly Webb (2007) suggest that, the standards and assessments can be aligned based on both the complexity of knowledge required by each as well as the category of content covered by each. If the cognitive demands placed on students during the assessment it means with what students are expected to know and be able to do as stated in the standards, then there is consistency between the standards and the assessment. At least 50% of the hits corresponding to an objective must be at or above the level of knowledge of the objective for there to be consistency between the assessment and the standard.

Conclusion

The study's major goal was to explore the curriculum and textbook alignment in geography for disaster risk reduction. The elementary school textbook alignment demonstrates a lack of integration and coherence among policy recommendations, curriculum students' learning outcomes, textbook content, and suggested classroom assessment activities. The evaluation and connectedness of horizontal and vertical alignment with specified standards were suggested, Furthermore, a textbook-driven approach was recommended to make it easier to introduce new concepts into textbooks.

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