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Social Studies Learning Design Based on RAMAH to Increase Awareness of Climate Change and Disaster Mitigation in Junior High School Students

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Abstract

Awareness of climate change and disaster mitigation needs to be instilled early on through contextual and referring to knowledge learning. However, Social Studies at the Junior High School level is still dominated by a theoretical approach that has not touched on students' real experiences. This study aims to design a social studies learning design based on RAMAH (Relevance, Affective, Referring to Knowledge, Real Action, and Holistic) to increase students' awareness of climate change issues and disaster preparedness. This study uses a quantitative approach with a design development research (DDR) model in four stages, namely: (1) needs analysis through literature studies, classroom observations, and interviews with social studies teachers; (2) designing a learning design based on RAMAH principles; (3) limited implementation in one of the junior high schools with Adiwiyata status in Greater Bandung; and (4) initial evaluation through pretest, posttest, and interviews to assess the impact on students' understanding and attitudes. The results show that RAMAH-based learning design has the potential to increase students' affective involvement and real actions in responding to environmental issues.

Keywords: Learning Design, Social Studies, RAMAH, Climate Change, Disaster Mitigation.

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1. Introduction

Climate crisis has become a health crisis according to the World Health Organization (WHO), which states that climate change is the biggest threat to health in the 21st century. (1). More than 70 organizations in medicine have stated climate change as an emergency condition, especially the American Medical Association (AMA), which issued a resolution in 2019 that calls on leaders to educate on enter content health climate change in the curriculum. (2). Although the problem is urgent, content the no consistent content entered into in curriculum (3).

Adaptation and mitigation efforts to change the climate are one of the agendas in SDG 13 by 2030. According to the 2022 Intergovernmental Panel on Climate Change (IPCC) report, there was an improvement amount greenhouse gas emission, significant greenhouse gases (GHG) in the atmosphere (4). Improvement amount greenhouse gas emissions causes the occurrence of global warming, which has an impact on the rising temperature Earth. Problems caused by climate change. Climate impact is wide to life, the world society (5).

Remember the impact of negative changes caused by climate change. The climate is very much big for the continuity of life for humans and other organisms, then requires effort. To face the matter, Mitigation and adaptation actions change the climate. One of the methods for facing an event that did not happen is to avoid. (6). Indonesia, as a vulnerable archipelagic country to natural disasters like floods,

landslides, earthquakes, and tsunamis, requires a proper educational approach to increase awareness and preparedness of society, especially the young generation.

The young generation, especially those at the age of school, has a high interest for learn and participating in real action to change the climate (7). Efforts to provide knowledge and skills to students at school will make the change agents. Through sector education and activities, education can become a method of reducing the risk of disaster that needs to be addressed for improved (8).

Education for climate change is from fulfillment right of every individual to protect nature for achieve a sustainable school environment at the Junior High School level is one of them, as it plays a strategic education own role in forming awareness among students about issues and disaster mitigation. At the junior high school level, according to A. Bandura, at the age of 1115 years old, owns social emotional in grow develop attitudes and character that enable collaboration, negotiation, and communication in response crisis climate, meaning that at this age they contribute to building skills, reflection, self, values, attitudes, and motivation to face crisis climate (9).

One of the efforts in bridging the education change climate, namely in the subjects of Social Science Studies. Social Studies education seeks to help students in the process of problem-solving so that students the better understand and comprehend the environment. In line with the framework for curriculum development, sustainable which involves knowledge of social, in his efforts to reach the Objectives. Direction of implementation of education change climate that includes sustainable education efforts to realize sustainable education IPS (10).

However, in practice, social studies in junior high schools still tend nature conventional and place less emphasis on aspects relevant to the lives of real students, aspects affective, as well as actions that can be done for the mitigation of disasters. The learning model often does not blend aspects holistically from social and environmental, so that student awareness of climate change and disaster mitigation is not optimal. Based on the problem said, research is aimed for to design Social studies learning based on RAMAH (Relevance, Affective, Referring to Knowledge, Real Action, Holistic), which is able to increase awareness, climate change, and disaster mitigation in junior high school students. Formulation problem main issue in the study. how does this design of RAMAH social studies learning increase awareness, change the climate, and mitigate disaster for junior high school students?

Approach the breakdown problem, learning based on RAMAH will be developed by integrating five principles: Relevance: Learning materials associated with the context of life, real-life students and problems, and local environment. Affective: Building empathy and caring students to impact change, climate, and disasters. Referring to Knowledge: Using data and facts, scientific for support, and a deep understanding. Real Action: Encourage students to take concrete action in mitigating disasters and adapting to climate change. Holistic: Integrating various aspects of social, economic, and environmental factors in the learning process. According to with principle of education quality, competence education climate change needs to be developed in a way gradually in accordance stages grow flower participant education (AF phase). Coverage competence climate change education in accordance with map competence impacts, causes, adaptation, and mitigation, as follows: picture map competence education change climate based on Teixeira & Crawford (2022) (11).

Various studies have previously shown the contribution of learning models in increasing awareness environment and understanding the issue of climate change among participants. Research conducted by Janah (12) Emphasizes the effectiveness of the Project-Based Learning (PjBL) model in increasing results of studies as well as awareness of the environment among students through activity real based on

Figure 1. Map competence climate change education

projects, such as processing rubbish on house stairs. While that, Priyono (13) Find that the implementation of the STEAM approach for science teachers at the junior high school level in Demak Regency is still in an early stage, partly big some teachers still unfamiliar with the STEAM concept, especially in the context of a material change climate, so that it needs to be strengthened in aspects of understanding the conceptual and implementative. Furthermore, Katmie (14) through the studies library, develop an idea, and integrate a digital learning module based on EzGCM into the local curriculum content for high school level. The module is designed to accommodate a multidisciplinary approach to increase literacy climate and participation in sustainability among students.

From the side conceptual literacy environment, Miterianifa and Mawarni (15) The Systematic Literature Review study confirms the importance of learning models based on literacy, interactive, participatory, and contextual environment, which has been proven can increase understanding and involvement of participants educated on ecological issues. As for Salsabila et. al. (16) in general, quantitative studies show that the use of interactive media, Edpuzzle, combined with the Open Inquiry learning model, can increase awareness of environmental issues in a significant way in the context of plastic waste.

Different from researchers who tend to focus on one approach or dimensions of learning, this research presents a social studies learning model based on RAMAH (Relevant, Affective, Referring to Knowledge, Real Action, and Holistic) as an innovative, pedagogical, in nature integrative. The RAMAH model is designed in a systematic way to answer the challenge of social studies learning that has been going on. This is still conventional and less accommodating of complex issues, climate change, and disaster mitigation. The novelty of this model lies in the combination of five main aspects in a simultaneous way in the social studies learning process, so that it not only builds conceptual understanding, but also forms affective awareness and encourages active student involvement in real-

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world action based on local. Thus, the RAMAH model provides a contribution new in the development of social studies-based learning that values more sustainability, completeness, and applicability at all Junior High Schools.

Based on results study literature conducted by researchers related to Social Studies Learning Design and Awareness Climate Change and Disaster Mitigation on Publish or Perish app with a range 2020-2025 time, which then analyzed using VOSviewer found that the IPS Learning Design is related to concept, development, media, design control group, development, and research. For Awareness of Climate Change and Mitigation of disasters related to learning disaster mitigation, climate change, learning media based

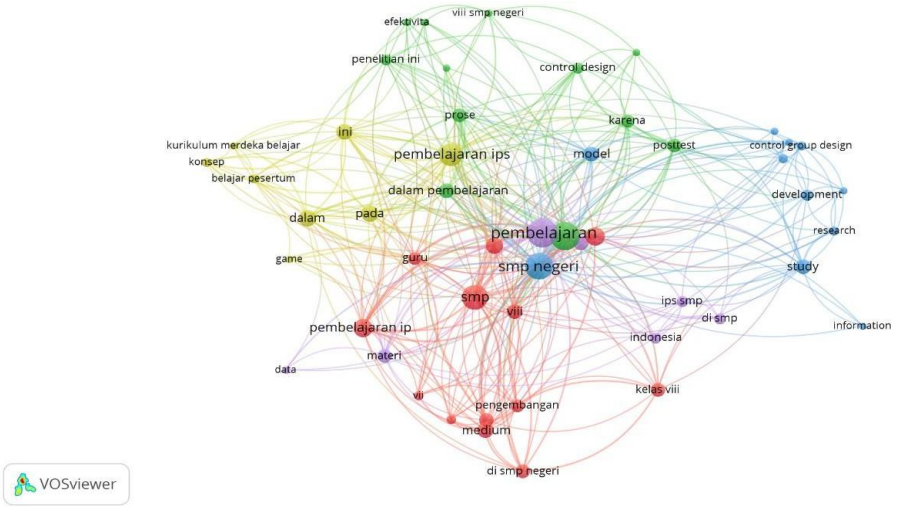

Figure 2. Bibliometric of Social Studies Learning Design

on disasters, material based on disasters, methods, and understanding student-related climate change and

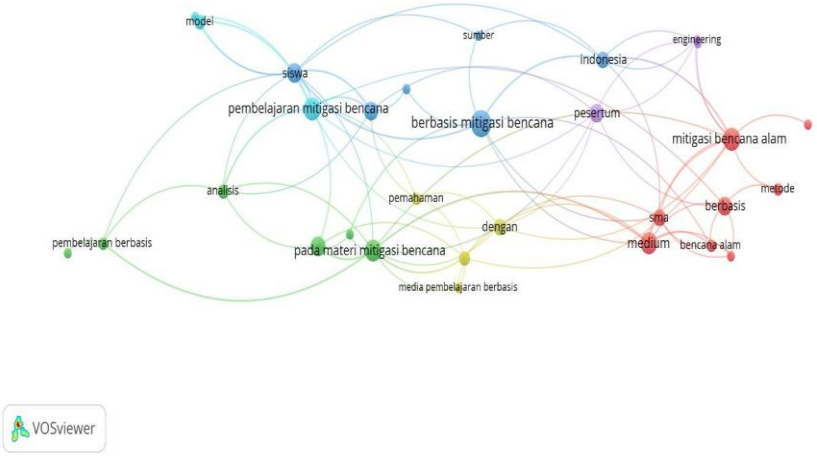

Figure 3. Bibliometric Awareness Climate Change and Disaster Mitigation

disaster mitigation. Through analysis that has been done seen if the process increases awareness, will change climate, and mitigation of disasters can be done through models or methods in social studies learning.

The novelty of this study lies in the integrative development of the RAMAH learning model (Relevance, Affective, Referring to Knowledge, Real Action, and Holistic) for Social Studies education, which simultaneously bridges cognitive, affective, and behavioral dimensions of climate change awareness. Unlike previously established models such as Project-Based Learning (PjBL) or STEAM, which primarily focus on project implementation or interdisciplinary scientific integration, the RAMAH model emphasizes the affective and real-action dimensions that are often underrepresented in conventional environmental education.

In PjBL, learning outcomes are frequently limited to the completion of projects rather than the internalization of environmental values (Janah, 2024). Meanwhile, the STEAM approach enhances conceptual understanding but tends to require high technological readiness and teacher competence, which remain limited in many Indonesian schools (Priyono et al., 2024). The RAMAH model, in contrast, offers a contextually adaptive framework that integrates local environmental issues, promotes empathy and moral reasoning, and culminates in measurable real-world action by students.

Theoretically, this approach aligns with Bandura's Social Cognitive Theory, emphasizing the role of self-efficacy and observational learning in behavior change, and supports Education for Sustainable Development (ESD) principles that demand holistic learning engagement. Empirically, the RAMAH model addresses the gap between conceptual understanding and behavioral action by embedding reflection, collaboration, and local problem-solving within Social Studies learning. Therefore, this study provides a scientifically justified innovation that extends the current pedagogical discourse beyond traditional models, contributing both to the field of Social Studies education and climate change awareness development.

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2. Methodology

2.1 Method

This study employs the Design and Development Research (DDR) method, an approach aimed at developing, testing, and refining an educational product or model based on needs and empirical evidence. (17) (18). Through the DDR method, a systematic investigation is conducted into the processes of design, development, and evaluation to establish an empirical foundation for the creation of educational and instructional products.

Based on the design, the population in this study consisted of schools that had received the Adiwiyata award from the Ministry of Environment in West Java Province. The research sample comprised three Adiwiyata schools in Bandung Raya, as well as Social Studies teachers, students, and the head of the Adiwiyata school.

2.2 Data collection techniques

In DDR, combine quantitative and qualitative approaches, with the technique used in this study being a literature study to understand the theory that supports the RAMAH-based learning model in social

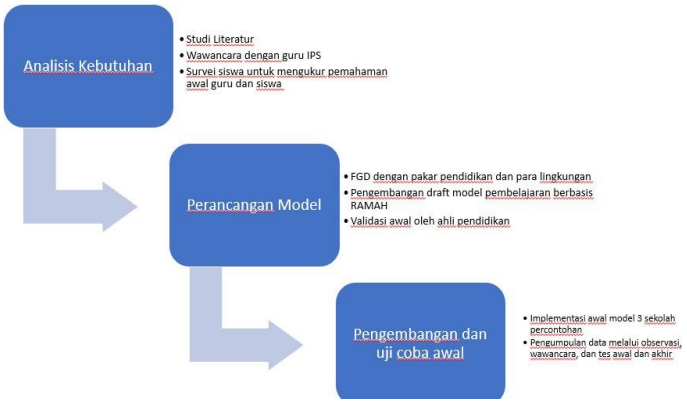

Figure 4. DDR method structure in research

studies subjects. Interviews with social studies teachers, education experts, and disaster mitigation experts. School observations to see the current social studies learning, pretests, and post-tests to measure the effectiveness of the RAMAH-based social studies learning model in improving student understanding. The location of this study was conducted at the Bandung Raya Junior High School (Bandung City, Bandung Regency, and West Bandung Regency), with the selection of schools implementing the Adiwiyata program. The schools designated based on these criteria were SMPN 7 Bandung City and SMPN 1 Lembang.

2.3 Data Analysis Techniques

Data analysis techniques use thematic analysis and descriptive statistics, and Ttests to test effectiveness, while interview results use Miles & Huberman with data triangulation to increase data validity and credibility. The data triangulation stages are carried out by presenting data, reducing data, and drawing conclusions (17).

Based on the table, the main targets are first, identifying the needs and problems of climate change learning in social studies subjects.

2..4 Indicators of Achievement

Indicators of achievement of literature study results, reports, and mapping of local environmental issues for teaching materials. Second, the preparation of a RAMAH-based learning model that is in accordance with school conditions, with indicators of achievement of draft learning models that have been prepared, teaching modules, and evaluation tools and models that have been validated by education experts, environmental experts, and disaster mitigation experts.

Table 1. DDR Research Stages

Research Stage	Objective	Main Activities	Output
Needs Analysis	Identifying the needs and problems in climate change and disaster mitigation learning in junior high schools	-Literature study on environment-based learning models - Interviews with Social Studies teachers - Student surveys to assess initial understanding	Report on needs analysis and initial recommendations
Model Design	Designing a RAMAH-based Social Studies learning model based on needs analysis results	-Focus Group Discussion (FGD) with education experts - Drafting the learning model - Initial validation by education experts	Draft learning model and learning evaluation instruments
Develompment and Initial Trial	Developing and testing the learning model in a limited trial	-Initial implementation of the model in 2 pilot schools - Classroom observation and interviews with teachers and students - Pretest and posttest to assess student understanding	Data on model effectiveness from initial trial
Model Implementation and Validation	Testing the model in a wider trial to validate its effectiveness	-Implementation in 5 junior high schools with Adiwiyata criteria - Evaluation of the model's impact on students' understanding and disaster preparedness - Interviews with principals and teachers	Validation report of the learning model from wider trial
Refinement and Dissemination	Refining the model and disseminating the research results	-Discussions with the Education Office - Publication of	Finalized RAMAH-based Social Studies learning model ready

3. Results and Discussion

3.1 Instrument Testing

Before the implementation of the RAMAH-based learning design, a preliminary testing phase was conducted to ensure the accuracy and reliability of the research instruments and to identify students' baseline awareness of climate change and disaster mitigation.

The pretest instrument, which measured students' conceptual understanding, demonstrated satisfactory content validity, as confirmed through expert judgment and statistical testing. The items showed significant correlations with total scores (Sig. < 0.05), indicating that the test effectively measures the intended constructs. The reliability analysis yielded a Cronbach's Alpha coefficient of 0.624, reflecting a strong level of internal consistency and confirming that the instrument is suitable for assessing students' initial conceptual awareness.

Table 2. Reliability Statistics

Reliability Statistics	
Cronbach's Alpha	N of Items
.624	15

Similarly, the questionnaire designed to measure students' affective and behavioral awareness showed a high level of validity and internal consistency, with a Cronbach's Alpha coefficient of 0.809. This confirms that the instrument consistently measures affective engagement and behavioral intention related to climate and disaster awareness.

Table 3. Reliability Statistics

Reliability Statistics	
Cronbach's Alpha	N of Items
.809	16

The pretest was administered to both experimental and control groups. The Kolmogorov–Smirnov normality test results indicated that the data were normally distributed ($p > 0.05$), and Levene's test confirmed homogeneous variance across groups ($p > 0.05$).

Overall, the pretest findings revealed that students' initial awareness levels were in the moderate range, particularly in the affective and behavioral domains. These results highlight the need for more contextual and emotionally engaging learning strategies, supporting the relevance of implementing the RAMAH-based Social Studies learning model in subsequent stages of development.

3.2 Preliminary Finding

The pretest phase provided an overview of students' initial understanding, attitudes, and behavioral intentions related to climate change and disaster mitigation before the implementation of the RAMAH learning model. Overall, the findings show that students demonstrated moderate levels of awareness, particularly in their conceptual understanding of environmental and disaster-related issues.

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However, their affective engagement such as empathy, concern, and willingness to participate in environmental action was still limited. Similarly, indicators of behavioral readiness, including proactive attitudes toward disaster preparedness and eco-friendly habits, were found to be relatively low. This pattern suggests that while students possess basic cognitive knowledge about environmental issues, they have not yet internalized these concepts into personal values or consistent behavioral practices.

Classroom observations during the pretest sessions reinforced these findings. Students were generally active and responsive when questions were linked to real-life contexts, but tended to lose engagement when confronted with abstract or theoretical content. This aligns with the RAMAH model's foundational premise that learning must be relevant, affective, and action-oriented to effectively foster environmental awareness.

Figure 5. Obervation class

These preliminary results underscore the importance of designing learning interventions that not only enhance students' cognitive understanding but also foster emotional connection and promote real-world application. The data from this phase serve as the foundation for refining the RAMAH-based Social Studies learning design, which will later be tested for its effectiveness in promoting deeper awareness and behavioral transformation among junior high school students.

3.3 Preliminary Study Report

3.3.1 SMP Negeri 1 Lembang

SMP Negeri 1 Lembang is a public junior high school located at Jl. Raya Lembang No. 357, Jayagiri, Lembang Subdistrict, West Bandung Regency. The school occupies an area of 7,635 m^2 and holds an A-accreditation. It has adopted the Merdeka Curriculum. The student population is 1,179, comprising 572 male and 607 female students. There are 30 class groups, with 10 for each grade level (7, 8, and 9). The total number of educators is 55, and there are 12 administrative staff members.

A preliminary study visit was conducted on Friday, August 15, 2025, with a meeting with Mrs. Dinna Diniati, a social studies teacher. The school has been actively implementing a *project-based learning* approach and holds the status of an Adiwiyata school, which indicates its readiness to adopt project-based and action-oriented learning. The school is currently developing a new cocurricular program

through an *in-house training* workshop. This program aims to achieve the eight student graduate profiles, with a specific focus on student autonomy and civic engagement. The themes of the activities vary by grade level: Grade 7 focuses on environmental awareness, while Grade 8 will explore local wisdom through a planned visit to the Cireunde Traditional Village.

The specific learning initiative discussed will be implemented for Grade 8 students, with teaching modules integrated into the social studies curriculum. This module focuses on the role of social institutions in the utilization of natural resources, particularly the role of the National Disaster Management Agency (BNPB) in earthquake mitigation. Mrs. Diniati confirmed that although Lembang is an earthquake-prone zone, the school has never conducted a disaster mitigation drill, making this initiative highly relevant. The implementation is planned for eight sessions, with class 8I serving as the experimental group and 8J as the control group. A key challenge identified is the minimal use of digital technologies such as VR and AR in the learning process.

3.3.2 SMP Negeri 7 Bandung

SMP Negeri 7 Bandung is located at Jl. Ambon No. 23, Citarum, Bandung Wetan Subdistrict. Its vision is to be a school that excels in character, achievements, arts, culture, environmental stewardship, and information technology. The school also holds an A-accreditation and uses the Merdeka Curriculum.

The student population is 1,007, consisting of 507 male and 500 female students. There are 30 class groups, with 10 for Grade 7, 9 for Grade 8, and 11 for Grade 9. The number of educators is 44, and there are 13 administrative staff members.

Based on the preliminary study, SMPN 7 Bandung has not specifically implemented a learning process with the RAMAH design. However, the school has launched a Co-curricular Program in late June 2025, stemming from the Ministry of Education Regulation No. 13 of 2025. This program is designed similarly to the previous P5 program to address student complaints about numerous project assignments with different group members. In this new program, students maintain a single group throughout the duration.

The main theme of the cocurricular program is Disaster Mitigation, which aligns with the Learning Achievements (CP) of various subjects and the school's objective for reforestation. The program is allocated 3 teaching hours per week over one semester. The themes are divided by grade level: Grade 7 focuses on environmental conservation, Grade 8 on disaster mitigation, and Grade 9 on a film project.

The school plans to invite external parties, such as the BNPB, to deliver material and intends to conduct field trips to locations like Tebing Keraton and the Lembang Fault. The challenges noted include an administrative process that is still in the planning stages and the need for stronger collaboration among teachers. However, students have responded positively as they are already accustomed to project-based activities like the P5 program.

3.4 Results and Discussion

Based on the findings of the preliminary studies, both schools, SMP Negeri 1 Lembang and SMP Negeri 7 Bandung, demonstrate a readiness and commitment to implementing project-based learning and cocurricular programs in line with the Merdeka Curriculum. Although they have different demographic and geographical characteristics, a significant similarity is their focus on the issue of disaster mitigation. SMPN 1 Lembang plans to integrate earthquake mitigation material into its social studies curriculum, while SMPN 7 Bandung has made disaster mitigation a central theme of its cocurricular program.

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From a methodological perspective, both studies provide an essential foundation for designing future educational interventions. The study at SMPN 1 Lembang offers a framework for an experimental design with a control group, which is a relevant quasi-experimental research method for measuring program effectiveness. In contrast, the study at SMPN 7 Bandung provides an example of a comprehensive cocurricular program implementation, involving interdisciplinary collaboration and external partnerships.

Collaboration among teachers and with external parties is identified as a key factor. SMPN 7 Bandung has taken a proactive step by inviting the BNPB, which can be considered a best practice. The challenges faced by both schools, limited digital technology use at SMPN 1 Lembang and administrative and collaborative issues at SMPN 7 Bandung, are important points to consider when designing a relevant and effective learning module or intervention.

Overall, both preliminary studies confirm that the school environments at SMPN 1 Lembang and SMPN 7 Bandung are highly conducive to the implementation of innovative learning programs focused on disaster mitigation. The data from these studies will serve as a strong basis for developing relevant and effective learning materials and for designing appropriate research methods to measure the program's impact.

The results of the pilot implementation demonstrate that the RAMAH-based Social Studies learning model significantly enhances students' awareness of climate change and disaster mitigation, both conceptually and affectively. Quantitative findings from pretest–posttest analysis show a statistically significant improvement in students' understanding and affective engagement. These results confirm that integrating relevance, affective engagement, and real action within Social Studies learning can transform abstract environmental concepts into Referring to knowledge and sustained student behaviors.

From classroom observations, students in the experimental group exhibited greater participation during reflective and real-action sessions, such as local environmental audits and simulation of disaster preparedness activities. Teachers also reported that students were more empathetic and proactive in discussing environmental solutions, suggesting that the RAMAH approach successfully internalizes sustainability values through experiential and collaborative learning.

In contrast, the control group that followed conventional instruction displayed more limited affective responses, often treating environmental topics as theoretical content rather than lived realities. This contrast underscores the importance of emotional engagement and real-world application, two central elements that distinguish RAMAH from models like Project-Based Learning (PjBL) or STEAM. While PjBL encourages project output and STEAM enhances interdisciplinary integration, RAMAH extends these by embedding moral reflection, empathy-building, and context-specific problem-solving, resulting in deeper personal transformation and action orientation.

Qualitative interviews with teachers further revealed several key aspects of implementation. Teachers found the RAMAH design to be adaptable to diverse classroom conditions, yet they also highlighted certain challenges: (1) limited time allocation for real-action projects, (2) the need for stronger teacher training in affective facilitation, and (3) limited access to digital media that could enhance student engagement. These challenges highlight that the successful implementation of RAMAH requires institutional support and ongoing professional development to ensure teachers are confident in integrating reflective and affective dimensions into their practice.

The findings of this study have several implications for Social Studies education. First, pedagogical innovation must not only prioritize knowledge transfer but also nurture empathy, responsibility, and action competence among learners. Second, contextual relevance—linking lessons to local environmental issues—makes learning personally Referring to knowledge and socially impactful. Third, collaboration with external stakeholders such as disaster management agencies and environmental NGOs can enhance authenticity and extend student engagement beyond the classroom.

These findings are consistent with the theoretical framework of Education for Sustainable Development (ESD), which positions students as active agents of change rather than passive recipients of knowledge. The integration of affective and behavioral domains aligns with the transformative learning perspective proposed by Mezirow, emphasizing critical reflection and participatory engagement. Thus, the RAMAH model provides a practical and scalable pathway for embedding sustainability competencies within the Indonesian Social Studies curriculum.

Implications for Practice: The RAMAH model can be effectively incorporated into existing curricula and co-curricular programs such as P5 or Adiwiyata activities. Teachers are encouraged to adapt local environmental contexts and provide opportunities for students to conduct real action, such as waste reduction initiatives, disaster drills, or community education campaigns. Teacher collaboration and peer reflection should be institutionalized to maintain consistency in practice.

Limitations and Future Research: This study was limited to two Adiwiyata schools in Bandung Raya, which may restrict generalization to other contexts. Future studies should conduct larger-scale implementations across diverse geographical areas and school typologies to assess the model's adaptability. Moreover, integrating digital learning tools (AR/VR simulations, eco-games, or data dashboards) could further strengthen affective and experiential learning outcomes. Longitudinal research is also recommended to evaluate the sustainability of behavioral changes over time.

4. Conclusion

The findings of this study emphasize the importance of redesigning Social Studies learning to address the challenges of climate change and disaster mitigation. The RAMAH-based model, which integrates Relevance, Affective engagement, Referring to Knowledge, Real Action, and a Holistic approach, demonstrates significant potential to foster not only students' conceptual understanding but also their emotional awareness and practical involvement. This aligns with the broader framework of Education for Sustainable Development (ESD), ensuring that education serves as a transformative tool in preparing young generations to face global environmental crises.

The preliminary implementation in Adiwiyata schools such as SMPN 1 Lembang and SMPN 7 Bandung confirms that this model can be effectively integrated into existing curricular and cocurricular programs. Both schools have shown readiness in terms of institutional vision and student responsiveness, even though some challenges persist, such as limited use of digital technology and the need for stronger collaboration among teachers. These findings affirm the model's feasibility while highlighting areas that require further refinement for optimal impact.

Based on the outcomes, it can be concluded that RAMAH-based Social Studies learning contributes Referring to knowledgely to building climate awareness and disaster preparedness among junior high school students. By bridging theoretical knowledge with real-world application, this model helps students

become proactive agents of change in their communities. Furthermore, the integrative nature of the model provides a framework that is adaptable to various school contexts, making it a promising innovation for broader educational practice in Indonesia and beyond.

In light of these conclusions, several recommendations can be made. First, further research and large-scale trials are necessary to validate the effectiveness of the RAMAH model across diverse school settings. Second, teacher training and professional development should be prioritized to ensure effective integration of this model, particularly in leveraging digital media and technology. Third, stronger partnerships with external stakeholders, such as disaster management agencies and environmental organizations, are encouraged to enrich learning experiences and provide authentic contexts for students' actions. Finally, policy support from educational authorities will be crucial in mainstreaming this model as part of sustainable education initiatives.

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