

Disaster Mitigation Tactics Through Enhanced Higher Order Thinking Skills via Active Learning in Social Science Education

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Abstract

This article aims to discuss innovative educational strategies to enhance students' understanding and engagement in disaster mitigation through social science learning. The approach used emphasizes the utilization of active learning to strengthen Higher Order Thinking Skills (HOTS) in facing complex disaster challenges. Through field experiences and literature studies, this article outlines the effectiveness of Active Learning in providing in-depth understanding of disaster mitigation. Additionally, it discusses the application of group discussions, role-playing games, and collaborative projects in fostering students' critical, analytical, and creative thinking. Through this approach, it is hoped that students will gain theoretical knowledge about disasters and practical skills to effectively address real-world challenges. The practical implications of this article lie in curriculum development and social science teacher training. In conclusion, the integration of Active Learning in social science education can be a strategic step in preparing future generations to manage disaster mitigation effectively.

Keywords: *Active Learning, Disaster Mitigation, Higher Order Thinking Skill, Social Science Education.*

Introduction

In this ever-changing era, challenges related to disasters are increasing in tandem with the complexity of environmental changes and human lifestyles. Amidst these pressures, efforts to reduce the impact of disasters become increasingly urgent to protect lives, property, and community infrastructure. Enhancing capabilities in responding to, analyzing, and mitigating disasters is imperative. [1]–[7]. In this framework, education plays a highly vital role in shaping individuals who are ready to face these challenges.

The existence of natural disasters and social crises has become an issue that cannot be ignored for the global community. In addressing this situation, efficient mitigation strategies become crucial to reduce their negative impacts and enhance community resilience. One of the continuously explored efforts is the development of Higher Order Thinking Skills (HOTS) through active learning approaches, particularly in the realm of social science education [8]–[11].

Education plays a crucial role in preparing the future generation to face disasters and social challenges. However, conventional educational methods often fall short in developing critical, creative, and analytical abilities that are essential for effectively responding to emergencies [12]–[16]. The purpose of this article is to explore how an active learning approach can enhance students' higher-order thinking skills in the context of disaster mitigation.

In this introduction, we will elucidate the theoretical and practical background of disaster mitigation strategies employing a Higher Order Thinking Skills-based approach [17], [18]. We will also explore the relevance of using active learning methods to enhance these skills, as well as the urgency of integrating social science learning in comprehensive disaster mitigation efforts. Thus, the objective of this article is to provide a strong foundational understanding of the crucial role of Higher Order Thinking Skills and active learning in addressing the challenges of disaster mitigation in the contemporary era.

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The development of social knowledge plays a crucial role in empowering communities with the knowledge, skills, and attitudes necessary to manage disaster risks [19]–[22]. However, to achieve this goal, new and effective learning strategies are required. One promising strategy is to integrate Higher Order Thinking Skills (HOTS) through the Active Learning approach.

In this context, this scientific paper will discuss disaster impact reduction strategies using the enhancement of Higher Order Thinking Skills (HOTS) through the Active Learning approach in social science education. The aim of this paper is to elucidate the basic idea, advantages, and implementation of this method in efforts to mitigate disaster impact. Additionally, this paper will explore the effects of implementing this strategy on students' understanding of disaster risks, their analytical abilities, as well as the attitudes and skills necessary to actively participate in disaster mitigation. By bridging the gap between theory and application, it is hoped that this article can provide added value in the development of efficient learning strategies to prepare communities for future disaster challenges.

Research Methodology

The method employed in this article combines practical experience with literature review. The article elucidates on the effectiveness of Active Learning Methods in facilitating comprehensive understanding of disaster mitigation efforts. The literature review encompasses topics such as disaster mitigation, Higher Order Thinking Skills (HOTS), Active Learning, and Social Studies.

Results and Discussion

In scientific terms, the goal of Social Sciences education is to equip the younger generation through a profound understanding of the social, cultural, economic, and political dynamics within society [23], [24]. This is because learning social sciences is part of the curriculum integration in education. However, Social Sciences play a role not only limited to conceptual understanding. Along with the highly complex challenges faced by the global community, such as natural and social disasters, social science is highly necessary in preparing the younger generation through education, which becomes crucial.

Natural disasters such as floods, earthquakes, volcanic eruptions, forest fires, and social disasters such as pandemics and poverty have become serious threats to the survival and well-being of communities worldwide [2], [3], [25], [26]. In facing these disaster threats, knowledge of the interaction between society and the physical and social environment plays a crucial role in disaster mitigation efforts, adaptation, and sustainable development.

Beyond understanding facts and concepts about disasters, the younger generation greatly needs to be equipped with Higher Order Thinking Skills (HOTS) that enable them to think critically through analysis, application, evaluation, and application of their knowledge of disasters in the context of complex situations. Social science provides a strong foundation in the development of Higher Order Thinking Skills (HOTS) and Active Learning.

Social Science plays a crucial role in preparing the younger generation for disaster mitigation, and how the implementation of effective educational strategies in social sciences can aid in the development of critically thinking skills essential in facing future challenges. By comprehending and delving into the contributions of social science education in disaster preparedness, it is hoped that resilient younger generations capable of adapting to the highly complex dynamics of the present time can be cultivated.

The learning of Social Sciences is not merely about understanding social structures and cultures, but also serves as a means to interpret and confront global challenges, including natural disasters. The impacts of natural disasters are widespread in society, and to mitigate these impacts, effective Higher Order Thinking Skills (HOTS) are necessary. An active learning approach focused on enhancing HOTS has been proposed as a strategy to strengthen society's skills in addressing and minimizing the impact of disasters.

Higher Order Thinking Skills

In scientific English, "HOTS" refers to higher-order thinking skills that require critical analysis, synthesis, and evaluation [10], [27]. In an attempt to mitigate disasters, HOTS facilitates individuals to recognize, evaluate, and develop efficient strategic measures in facing disaster risks. These skills surpass the understanding of fundamental concepts and enable quick adaptation to changing situations.

Higher Order Thinking Skill (HOTS) is a mental ability that demands high-level thinking from students. This concept is grounded in the stages of Bloom's taxonomy. Bloom divides thinking abilities into two main categories: LOTS (Lower Order Thinking Skill) and HOTS (Higher Order Thinking Skill), which are abilities to think at low and high levels, respectively. HOTS is the thinking process that encourages students to manipulate existing information and ideas in a certain way to gain new understanding and implications [28], [29]. For example, when students integrate facts and ideas in the synthesis process, make generalizations, explain, formulate hypotheses and analyses, until reaching a conclusion.

Meanwhile, the way lecturers or teachers stimulate student engagement from an early age can be explained as follows: a) When starting a lesson, it is important to activate students early on; otherwise, the risk of passive tendencies such as "waiting for paint to dry" may arise; b) Various opening activities are designed to introduce students to the material, stimulate their minds, and pique their interest in the subject; c) These activities are likened to 'appetizers' to stimulate students' learning appetites, provide motivation that needs to be overcome, and then followed with full attention; and d) Although some lecturers or teachers may choose to start the lesson with a brief observation, incorporating introductory exercises into lesson planning is at least an important and beneficial initial step.

Some requirements that must be met during the learning process include: a) Maintaining control of the situation while allowing students freedom in their learning activities; b) Stimulating students' thinking to address given problems or situations, thereby encouraging them to actively seek information, think critically, and enhance their understanding of the learning material; c) Organizing various learning activities tailored to students' characteristics and needs to prevent boredom, especially if they are solely listening to explanations from the instructor; and d) Encouraging students to express opinions, ask questions, and actively participate in learning. Instructors can train students to confidently express opinions and ask questions after presenting engaging materials such as videos, demonstrations, or other media, thereby building students' confidence in mastering the material and critical thinking.

With the proven effectiveness of High Order Thinking Skills (HOTS)-based learning, every educator is encouraged to adopt several principles in HOTS-based learning, including: a) Designing tasks that align with students' expectations or needs; b) Stimulating students' curiosity; c) Providing tasks or questions that prompt students to think actively; d) Assessing real-life problems faced by students within context; e) Cultivating students' imagination through writing or drawing activities; f) Providing opportunities for students to elaborate and engage in divergent (lateral) thinking; g) Offering students opportunities to choose topics or learning methods in class; h) Not blaming students for questions or actions that are out of the ordinary; i) Granting students freedom to experiment; j) Providing feedback and appreciation for students' work; k) Training students to ask questions and formulate problems in an effort to solve challenging issues; l) Teaching students to think critically by analyzing and evaluating presented data or information; m) Training students to make decisions related to the situations they face.

Active Learning

Active learning is an educational method in which learners actively engage in the learning process through activities such as reading, writing, or discussing. Examples of active learning practices include reflection periods, paired learning, large and informal group discussions, peer review, interactive lectures, concept mapping, idea exchanges, collaborative writing, cooperative learning, short response papers, case study analysis, and simulations [30]–[33].

When employing active learning strategies, it is crucial for an instructor to consider the adequacy of time, the level of difficulty, and the relevance of exercises to the material being presented. It is advised for instructors to begin with simple and uncomplicated activities. Examples from the literature that require minimal time include one-minute papers, brief reflections, self-assessments, large group discussions, and think-pair-share methods.

For the past few decades, academics have reviewed various pedagogical models adopting instructional and constructivist approaches. They believe that the constructivist approach facilitates the development of skills essential for professional success. The use of active learning methods is considered a suitable strategy for implementing constructivist principles in the learning context. The emphasis placed on active learning acts as a key differentiator among other theories of human learning. This method allows students not only to be passive recipients of information but also to actively engage through observation, experimentation, and interaction. The concept of active learning is defined as an instructional approach that positions students as active subjects in the learning process, distinct from their roles as passive recipients of information. The implementation of active learning opens opportunities to enhance the quality of teaching in various fields of knowledge, including science and technology, which in turn provides a deeper significance to the material being studied.

Empirical Study on the Impact of HOTS through Active Learning Approach on the Social Science Learning Process in the Context of Disaster Mitigation

The importance of developing high-level thinking is crucial in advancing individuals' abilities to become problem solvers for both themselves and their environment. High-level thinking not only encompasses the ability to solve problems but also leads to sensitivity towards social dynamics and encourages individuals to become solutions to the challenges they face. High-level thinking skills refer to an active mental process of exploring complex experiences reflectively and creatively with the aim of achieving deep understanding. This process is deliberately undertaken to achieve specific goals, including the development of analytical, synthetic, and evaluative abilities.

One of the challenges currently faced in the realm of global education is the low level of students' high-order thinking skills in the discipline of Social Sciences. This is triggered by the lack of effectiveness in the daily learning process to explore and develop the interests, talents, and potentials inherent in each student.

In class, the learning process still tends to be theoretical and emphasizes the teacher's role as the center of activity. The commonly applied teaching models are still conventional, such as lectures and discussions, with an emphasis on note-taking and student listening. However, this approach has certain weaknesses. It results in a lack of student engagement in the learning process, ultimately leading many students to become passive. Although some students may be active in speaking, their activity does not always manifest in the teaching and learning activities. When the teacher provides explanations, some students may ask questions, but these questions tend to be unfocused on the learning material and often diminish the role of the teacher. Furthermore, the questions given in daily exams or class promotion assessments are still limited to the realm of knowledge and low-level understanding, with little discussion at higher levels of analysis.

High-level thinking skills are an important aspect in the development of Indonesian students, indicating complexity in their cultivation. Although not easy, it is important to acknowledge that high-level thinking skills can be acquired through appropriate learning and exercises. The importance of this early learning cannot be underestimated, considering its essence in preparing individuals to face future demands. One effective approach is to integrate learning focused on the development of high-level thinking skills into the educational curriculum. By emphasizing this aspect, the learning process can become more meaningful and provide significant benefits for both students and educators.

The importance of mastering high-level thinking skills for students is to prepare them to face future demands. Schools need to instill high-level thinking skills to ensure students have a strong foundation for success in their careers and lifelong learning. These high-level thinking skills enable students to effectively

tackle daily challenges, including critical thinking abilities, logical reasoning, relevant understanding of the issues at hand, and decision-making skills.

Disaster Risk Reduction (DRR), as regulated by Law Number 24 of 2007, refers to a series of actions aimed at reducing the likelihood of disasters, whether through the development of physical infrastructure or efforts in education and enhancing preparedness to face disaster threats. The concept of DRR is also emphasized in the focus of the United Nations International Strategy for Disaster Reduction (UNISDR) in 2009, which states that disaster risk reduction is a structured approach to assessing and addressing factors contributing to disaster risk, exposure to risk, human and material vulnerability, as well as the adverse impacts of disasters.

The PRB approach consists of two main prioritized aspects: first, increasing awareness and resilience of the community towards disasters through knowledge, innovation, and education; second, strengthening community preparedness in facing disasters so that the response provided becomes more effective. Considering these fundamental aspects, education is regarded as a means to enhance the community's ability to implement PRB. In the context of learning, PRB is integrated as part of the disaster education curriculum aimed at enhancing understanding and awareness of the importance of reducing the impacts of natural disasters, as well as strengthening the ability to respond to and recover from these disasters.

The alignment of knowledge about Disaster Risk Reduction (DRR) into the curriculum structure aims for two main purposes. First, in the short term, this effort aims for students to acquire the understanding and skills necessary to survive in disaster situations and contribute to reducing associated risks. Second, in the long term, this integration aims to prepare future generations to be ready to face disaster threats equipped with knowledge of prevention efforts, mitigation, and disaster preparedness. Disaster education in the Geography curriculum cannot be separated from a scientific approach to learning and the need for 21st-century competencies, known as the 4Cs: communication skills, collaboration, critical thinking and problem-solving, as well as creativity and innovation. These competencies become vital assets in shaping a generation that is not only competent and competitive but also resilient in facing increasingly tight global and regional competition. One relevant scientific learning method is Literacy, which involves a series of activities ranging from observation, questioning, information gathering, reasoning, to communication, all integrated into the context of scientific learning. It is from here that the concept of disaster information literacy emerges as an essential part of disaster education.

In optimal situations within the education system, the implementation of disaster mitigation efforts becomes imperative within the school environment, especially in areas vulnerable to natural disasters [34], [35]. The main goal is to deepen knowledge and enhance readiness in facing such emergency situations. The importance of disaster mitigation efforts has become a driving force for various countries around the world to take concrete steps. An example is Japan, which specifically faces vulnerabilities to natural disasters and has implemented disaster mitigation programs through strong collaboration among various stakeholders in the country. Furthermore, Japan's preparedness is reflected in the existence of the Environment and Disaster Mitigation Course (EDM course). Since 1998, the country has integrated disaster mitigation curriculum into its education system.

In fact, in Indonesia, there are still many discussions regarding disaster mitigation curriculum, and this has not yet become a standalone subject. Practically, disaster education is currently integrated with other subjects and delivered through interdisciplinary curricula, both directly and indirectly related. This is done to avoid additional burdens in the learning process.

From the perspective of interdisciplinary integration, disaster mitigation curriculum can be introduced into school curricula, particularly in the Social Sciences subjects at the Elementary and Junior High School levels. In Junior High School, the disaster mitigation education approach can be incorporated into various content standards and basic competencies of Social Sciences, whether related to historical, economic, geographical, or sociological aspects.

Many efforts have been made in implementing disaster mitigation education, with Indonesia being one of the countries that has ratified the Hyogo Framework for Action (HFA)[36], [37]. Institutional commitment drives efforts to prioritize the reduction of loss of life, social assets, economic impacts, and environmental consequences resulting from disasters.

Disaster has become a primary concern in the development agenda, given that development efforts that have been undertaken for decades or even centuries can be destroyed or disrupted suddenly due to disaster events. Its impacts are not only limited to economic, social, and cultural infrastructure losses, but also result in setbacks in the economy of communities and nations [3], [25], [26]. The community affected by disasters often has to restart their lives from scratch by rebuilding infrastructure and social networks, sometimes necessitating migration to new places to begin anew.

Conclusion

The conclusion of the scientific article states that implementing disaster mitigation tactics through enhancing High Order Thinking Skills (HOTS) via Active Learning can be an effective approach in the Social Science (IPS) learning process. By strengthening students' abilities in critical, analytical, and creative thinking through active learning methods such as group discussions, case studies, and simulations, it can enhance their understanding of disaster concepts as well as how to manage and respond to them. This can prepare the next generation with the necessary skills to effectively confront complex and diverse disaster challenges, thereby reducing their negative impacts on society and the environment.

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