








# Community-Based Web-Learning Disaster Mitigation Learning Media Innovation to Improve Student Learning Motivation

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**Abstract.** This research is motivated by the development of community-based web-learning media for students. The media has been declared fit for use, but efforts are needed to determine its impact on student learning motivation. This study aimed to determine the effect of community-based web-learning disaster mitigation learning media on student motivation. This research is experimental research with a pretest-posttest design. This research involved 60 students. The data collection instrument uses a questionnaire. Data analysis techniques involve a normality test, a two-variant similarity test, and a hypothesis test consisting of a two-mean difference test, an influence test between variables, and a normalized gain test. The results of the study state that the use of community-based web-learning media can increase student learning motivation. The implications of this research can be used as an innovation in developing student learning motivation in disaster mitigation learning. This research can also be used as a reference in developing other learning media.

**Keywords:** innovation, disaster mitigation, web-learning, community.

## 1 Introduction

Digital-based learning innovations in the era of the industrial revolution 4.0 are significant [1]. Advances in digital technology, such as artificial intelligence, cloud computing, the Internet of Things, and big data, mark this revolution. These technologies have changed how humans work, interact, and learn [2-3]. Digital-based learning utilizes digital technology to provide a better learning experience. This innovation allows learning materials to be accessed quickly, communication between teachers and students becomes smoother, and learning tools and platforms are available to support the teaching and learning process [4]. Therefore, the need for learning innovations to be developed for all levels of education, including education in tertiary institutions.

Universities need learning innovations to improve the quality of education and meet the demands of the times [5]. In the era of the Industrial Revolution 4.0, the

development of digital technology was very rapid, and technology-based learning innovations became important [6]. By utilizing technology, higher education institutions can provide more comprehensive access to learning resources, improve learning experiences through visual and multimedia media, and utilize adaptive learning systems [7]. In addition, learning innovations enable flexible learning through online access and distance learning [8]. Students can study according to their preferences and schedule. This innovation also encourages active engagement and collaboration between students, preparing them for the complex world of work. By bringing learning experiences relevant to the real world, developing digital skills, and facilitating engagement with industry, learning innovations help universities prepare students for a successful future in an increasingly complex and rapidly changing world of work.

One form of innovation that is important to develop in higher education is digital-based learning. In the Industrial Revolution 4.0 era, which was dominated by digital technology, digital-based learning is a relevant and effective solution for enhancing student learning experiences [9]. Through digital-based learning, students can access various learning resources online, including lecture materials, electronic books, scientific journals, and learning videos. Digital learning platforms also allow students to interact with instructors and fellow students through online forums, discussions, and collaborative projects. The flexibility of time and place is also an advantage of digital-based learning, which allows students to study according to their schedules and personal preferences [10-11]. In addition, digital technology can be used to enrich the learning experience with interactive features, simulations, and the use of attractive visual media. Digital-based learning also prepares students with crucial digital skills in an increasingly digitally connected world of work [12-13]. By utilizing this digital-based learning innovation, higher education institutions can increase the efficiency and effectiveness of learning, expand educational accessibility, and prepare students to face future challenges.

One digital learning that can be developed is learning using web-learning media. Web-learning-based learning media is an essential innovation in digital-based learning that can be developed for students [14]. Web learning uses a web-based platform that allows students to access learning materials, interact with instructors and fellow students, and conduct evaluations online [15]. Students can study independently with access to various learning resources such as text, video, audio, and interactive multimedia. The flexibility of web learning allows students to study anytime and anywhere, according to their schedules and preferences. The web-learning platform can also provide material recommendations tailored to student's level of understanding and ability and allows evaluation of online learning through tests, assignments, and discussion forums. With the development of web-learning-based learning media, higher education institutions can improve educational accessibility, enrich learning experiences, and help students achieve better learning outcomes. Therefore, in previous research, researchers have developed a web learning on disaster mitigation learning for students.

This web-learning media was developed by combining the principles of community-based disaster mitigation. Community-based disaster mitigation is an approach that involves active participation and community involvement in dealing with natural or

artificial disasters. In this approach, disaster-affected communities become critical players in identifying risks, planning mitigation actions, and implementing steps to reduce risks and build community resilience. This web-learning media has been declared valid and suitable for use by experts. However, this research is only limited to validity tests. Further tests are needed to determine the effect of using web-learning media. One important variable that must be known is the motivation to learn.

Learning motivation is an internal drive or desire that influences a person's behavior and efforts to participate actively in the learning process [16]. This statement includes individual tendencies to seek knowledge, understand the material, and develop new skills. Learning motivation is a critical factor that influences how much a person is involved in learning, survives in the face of challenges, and achieves good learning outcomes [17]. Learning motivation has a strong relationship with the quality of student learning. People with high learning motivation tend to be more involved and active in the learning process [18]. They ask questions, participate, and seek deep understanding. This active engagement contributes to better-quality learning. In addition, high learning motivation also helps a person to stay focused and concentrate on learning tasks, overcome distractions, and strengthen their memory. Strong motivation also encourages hard work, perseverance, and persistence in facing learning challenges. Motivated individuals tend not to give up easily and keep trying to achieve their learning goals. This high enthusiasm impacts the quality of their learning outcomes by achieving a more profound understanding, better mastery of skills, and the ability to apply knowledge in real situations. Therefore, maintaining high learning motivation is essential in improving the overall quality of learning.

Therefore, this study aimed to determine the effect of community-based web learning on student motivation. This research must be carried out as a form of effort to develop learning innovations in disaster mitigation studies. In addition, this research is also an effort to increase the motivation and quality of student learning in tertiary institutions.

## 2 Method

This research was conducted at the Department of Geography Education, University of Samudra, using a quantitative method as experimental research with a pretest-posttest design. The population of this study was all students of the Department of Geography, University of Samudra. This study used a purposive sampling technique, selecting 30 students from the Unit 1 class as the group using community-based web-learning media and 30 students from the Unit 2 class as the group taking conventional learning.

The independent variable in this study is community-based web learning, while the dependent variable is student learning motivation. Data was collected using a questionnaire with a Likert scale as a research instrument. Data analysis involved a normality test, a two-variant similarity test, and a hypothesis test consisting of a two-mean difference test, an effect test between variables, and a normalized gain test.

### 3 Research Result

In the experimental group, web-learning media was used as a treatment used in the learning process, while the control group followed the conventional learning process. A summary of the pre-test and post-test results for the two groups can be found in the following table:

**Table 1.** Recapitulation of pre-test and post-test scores

Class	Pre-test	Post-test
Experimental Class	51,48	86,37
Control Class	52,69	64,29

The data in Table 1 shows that the average post-test score in the experimental group is higher than the average in the control group. The following initial step is to conduct a normality test to evaluate whether the data is normally distributed. The normality test results can be found in the following table:

**Table 2.** Results of normality test

Data	Class	$X^2_{count}$	$X^2_{table}$	Criteria
Pre-test	Experimental Class	0.183	0,218	Normal
	Control Class	0.143	0,218	Normal
Post-test	Experimental Class	0.212	0,218	Normal
	Control Class	0.138	0,218	Normal

Based on the data listed in Table 2, the calculated  $X^2_{count}$  value for each data is smaller than the  $X^2_{table}$  value. This result shows that both post-test and pre-test data have a normal distribution. Furthermore, a homogeneity test was carried out to determine whether the post-test data from the experimental and control groups had a similar level of homogeneity. The homogeneity test results can be found in the following table:

**Table 3.** Results of homogeneity test

Variance		F-count	F-table	Criteria
Experimental Class	Control Class			
105,38	156,32	1.21	3,316	Homogeneous

Based on the data listed in Table 3, it can be concluded that the calculated F value is smaller than the table F value using a significance level of 5%. Therefore, the two data come from the same variance. After confirming that the data has a normal distribution and level of homogeneity, the next step is to test the hypothesis using the T-test. The results of the T-test can be found in the following table:

**Table 4.** Test results of the difference between the two averages

Class	Averages	Variance	T-count	T-table	Criteria
Experiment	86,37	105,38	3,47	1.69	The average student learning

motivation in the experimental class is greater than that of the control class

Based on the data contained in Table 4, it can be concluded that the calculated t value is greater than the t table value. Therefore, the average student motivation in the experimental group is higher than the average in the control group. To find out whether the use of community-based web-learning media influences learning motivation, an influence test was carried out between variables. The results of calculating the effect can be found in the following table:

**Table 5.** Test results of the influence between variables

Class	Averages	rb	Conclusion	Criteria
Experimental	86,37	0.81	Positive Influence	High
Control	64,29			

Based on the data listed in Table 5, it can be observed that the correlation coefficient rb is 0.81. This result indicates that learning using community-based web learning significantly influences student learning motivation. Furthermore, the normalized gain test can determine the level of increased student learning motivation. The results of the n-gain test calculations are presented in the following table.

**Table 6.** Results of N-Gain calculation

Class	Pre-test	Post-test	N-Gain	Criteria
Experimental Class	51,48	86,37	0.71	High
Control Class	52,69	64,29	0.26	Low

Based on the data in Table 6, there was a more significant increase in learning motivation in the experimental group compared to the control group. The increase was categorized as high in the experimental group and low in the control group. These findings provide evidence that the use of community-based web learning affects increasing student learning motivation.

The results of this study are supported by research conducted by Sa'diah et al. (2022), which examined the feasibility of Web-based virtual student worksheets on disaster mitigation materials to improve critical thinking skills and learning outcomes for vocational students [19]. The study results stated that the worksheets developed were feasible for use in the learning process. This research is also supported by research conducted by Kurniawan & Trimasukmana (2020), which examines the use of Korean dramas as an audio-vocal learning medium for disaster mitigation geography [20]. The study results stated that students who studied using Korean dramas had a high interest in learning compared to students who studied conventionally. Other supporting research is research conducted by Rosyada et al. (2023) which examines the development of Android-based landslide disaster mitigation learning media for elementary school students with disabilities [21]. The results of the study stated that the learning media for landslide disaster mitigation based on Android for elementary school students with disabilities that had been developed was declared fit for use by experts. From the three results of this study, digital-based learning for disaster mitigation learning has begun to develop. The results of this study can add to a new study

that the developed community-based web-learning learning media can increase student learning motivation in disaster mitigation learning.

Using community-based web-learning learning media in disaster mitigation learning can increase student learning motivation due to several factors. The first factor is the process of collaboration and interaction. Community-based web-learning learning media allow students to interact and collaborate with fellow students, lecturers, and practitioners in disaster mitigation. Students can share their experiences, knowledge, and ideas, which can generate a higher sense of enthusiasm and motivation to learn [22-24]. This collaboration can also enrich students' understanding of disaster mitigation through different perspectives and experiences.

The second factor is learning that is developed, relevant, and practical. Through web-learning learning media, students can learn about disaster mitigation directly using existing resources and case studies. They can access relevant learning materials, documentary videos, simulations, and real case studies about disasters in various regions. These activities help enrich their learning experience and provide a practical context that can increase learning motivation [25-27]. The third factor is learning flexibility and having high accessibility. Web-learning learning media allows students to access learning materials anytime and anywhere. Students can study according to their needs and free time, which provides flexibility in managing time and learning. This easy accessibility can help students feel more involved and motivated in learning [28-30].

Another factor is that the system involves support. In community-based learning, students can feel supported by fellow learning community members. They can share challenges, get feedback, and motivate each other. This social support can increase student learning motivation by providing a positive sense of togetherness and support [31-33].

By combining these elements, the use of community-based web-learning learning media in disaster mitigation learning can provide learning experiences that are interactive, relevant, practical, flexible, and supported by the learning community. These factors can significantly increase student learning motivation in understanding and applying the concept of disaster mitigation in a more accurate and helpful context.

## **4 Conclusion**

The results of the study state that the use of community-based web-learning media can increase student learning motivation. Students who study using community-based web-learning media have a high N-Gain score.

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