

# Developing GeoHepi Application as Interactive Learning Media for Flood Disaster Mitigation Materials

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## ABSTRACT

The purpose of this research is to develop a learning application related to flood disaster mitigation materials for 11th grade high school students in Kendal Regency. The method used is ADDIE. The average result of media expert validation is 3.80, material expert 3.48, geography learning practitioner 3.86, small-scale and large-scale trials sequentially get responses from students after using the application with an average score of 3.27 and 3.42. From the results of all responses, an average was carried out with a result of 3.58 so that it got an A value, which is a very suitable category for use in the implementation of learning technology for flood disaster mitigation materials.

**Keywords:** GeoHepi; Learning Media; Flood Disaster Mitigation.

## INTRODUCTION

Technological progress is a potential to realize the goal of national education, which is to prepare students to become a digitally literate generation, so that the learning process does not only integrate literacy, attitudes, knowledge, and skills but also needs to maximize the potential of today's highly advanced technology in the form of scientific learning (1-4). The implementation of scientific learning that is supported in the use of technology aims to improve the skills needed today, students have digital skills for collaboration,

creativity, criticality, information gathering, and problem solving (5).

Digital capabilities that will be developed in the learning process are related to flood disaster mitigation materials that often occur in Kendal Regency. Data obtained from the Kendal Regency BPBD for the last four years, 2018-2021 there are 18 sub-districts out of a total of 20 that experienced floods (6). Until now, learning to provide an understanding of flood disasters is still in the form of non-digital. The use of problem based learning learning models is for disaster mitigation literacy with the aim of improving students' skills related to flood disasters (7). The flood disaster mitigation literacy in the study did not reflect digital skills. Another research on the use of technology media for flood disaster mitigation is the use of the Edmodo application at SMA N 2 Sukorejo, Kendal Regency. This media is just a digital class management so it doesn't have interactive content in flood disaster mitigation learning (8).

Flood disaster education that has been carried out in geography subjects has not reflected interactive media that can train digital skills. Interactive media technology to train digital skills in flood disaster mitigation materials is needed in learning activities. The media will be developed in the form of e-learning with interactive content. Media is considered interactive if it has two characteristics, it can be accessed by anyone and has a reciprocal

relationship between the user and the media (9). This interactive media technology concept will be realized in a GeoHepi application development. The problem faced at this time is the unavailability of interactive learning media with technology for flood disaster mitigation materials in grade 11 at Kendal Regency Senior High School. The purpose of this research is to develop an application to provide learning related to flood disaster mitigation materials for 11th grade high school students in Kendal Regency.

## MATERIALS & METHODS

This research was conducted to develop an interactive media with technology in geography learning on flood disaster mitigation materials. The development model is carried out using ADDIE which consists of Analysis, Design, Development, Implementation, and Evaluation. In the first stage, the researcher conducted an analysis related to the needs of students and teachers in learning geography for flood disaster mitigation materials that can improve digital skills. The design stage is carried out by making product plans such as media design, determining flood disaster mitigation materials, and determining interactive contents on the media. The development stage is carried out by making GeoHepi application, validation by media and material experts and validation of geography learning practitioners. The implementation phase is carried out for testing the media that has been developed through small-scale trials and large-scale trials. The evaluation stage is the improvement of the media that has been used in the implementation for the improvement of the media. The data analysis used is descriptive quantitative from the value of the validation results of experts, practitioners and students who have been made into ideal assessment criteria. Media assessment criteria of validity can be seen in table 1 (10).

Table 1. Ideal Assessment Criteria

Value	Score Range	Average Score	Category
A	$X > \bar{X}_i + 1,8 \times s_{bi}$	$X > 3,4$	Very Feasible
B	$\bar{X}_i + 0,6 \times s_{bi} < X \leq \bar{X}_i + 1,8 \times s_{bi}$	$2,8 < X \leq 3,4$	Feasible
C	$\bar{X}_i - 0,6 \times s_{bi} < X \leq \bar{X}_i + 0,6 \times s_{bi}$	$2,2 < X \leq 2,8$	Enough
D	$\bar{X}_i - 1,8 \times s_{bi} < X \leq \bar{X}_i - 0,6 \times s_{bi}$	$1,6 < X \leq 2,2$	Deficient
E	$X \leq \bar{X}_i - 1,8 \times s_{bi}$	$X \leq 1,6$	Very Deficient

$X$  = Average Score

$\bar{X}_i$  = Ideal Average

=  $\frac{1}{2}$  (ideal maximum score + ideal minimum score)

$s_{bi}$  = Ideal standard deviation

=  $\frac{1}{6}$  (ideal maximum score – ideal minimum score)

## RESULT

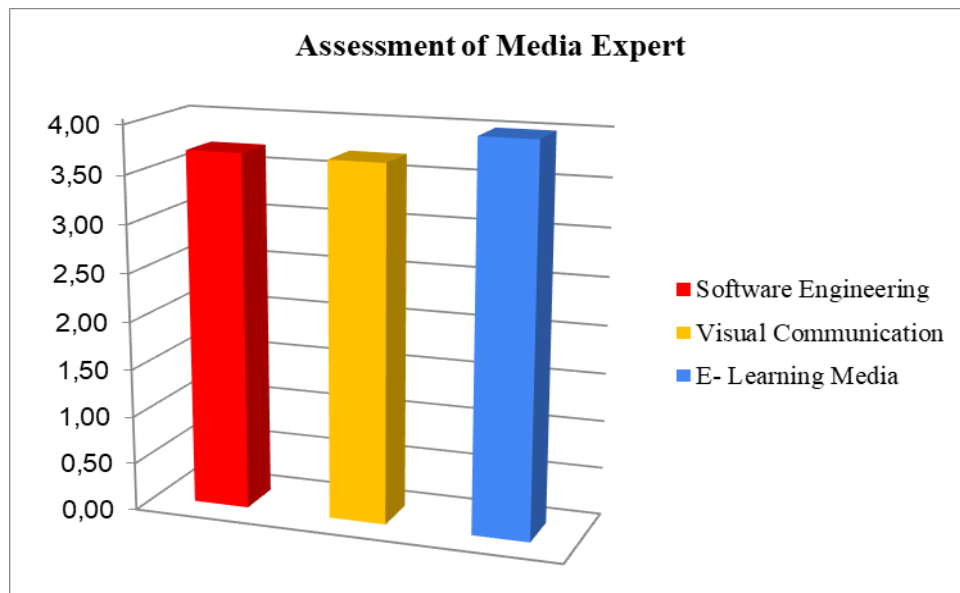
The results of the analysis at this stage are divided into two stages, needs analysis and instructional analysis. The needs analysis in this study shows that the existing conditions of learning media related to flood disaster mitigation are still dominant in the form of offline media such as the use of audio-visual media containing steps for flood disaster mitigation. (11). The current need is real-time technology media, making it easier to operate online and contextually, it is very necessary to provide an education regarding flood disaster mitigation in the location around the research. The instructional analysis is the determination of the content of the media needed in development to clarify the ultimate goal of developing a media (12). Technological interactive media that will be developed in class 11 on flood disaster mitigation materials according to surrounding conditions. This design stage is carried out by designing interactive media with flood disaster mitigation material in the form of an interactive book covering competencies to be achieved, learning objectives, interactive materials, and assessments to measure student understanding. The design of existing storyboards in application development can be seen in table.2.

**Table 2. Storyboard Explanation on Application**

Scenario	Scenario Explanation
Scene 1	Containing cover from interactive book media
Scene 2	Containing basic competencies that must be learned
Scene 3	Containing learning objectives
Scene 4	Containing stimulus related to flood disaster
Scene 5	Containing interactive video of the flood disaster that allows students to interact with the video with a button that appears in the middle of the video when it is running.
Scene 6	Containing pre-flood disaster material in the form of image hotspots
Scene 7	Containing material during the flood disaster in the form of image sliders
Scene 8	Containing post-flood disaster material in the form of accordion
Scene 9	Containing flood disaster risk reduction material in the form of image sliders
Scene 10	Containing Assessment related to flood disaster mitigation materials
Scene 11	Containing references used in making media

In this development stage, the researcher developed a media based on the analysis and design stages to be realized in the form of the GeoHepi application with content in the form of an interactive book containing flood disaster mitigation materials for 11th grade students at Kendal Regency Senior High School. The results of the development of the media will be validated by media experts, material experts, and geography learning practitioners. The validation results will be tested in a small class with 25 students and a large class with 40 students.

The media validation test was carried out by two expert validators with assessment aspects in the form of software engineering, visual communication, and e-learning media. The results of the media test questionnaire show that the average media validity test gets an A value with an average score of 3.80 so that the media is categorized as very good for use in learning flood disaster mitigation. The results of the media expert validation test are described in several aspects, in Figure.1



**Figure 1. Validation of Media Expert**

There are two material expert validators to carry out material validation tests on the developed media. The aspects is assessed from the material test include material, interactive content, language and implementation. The results of the material test on the developed GeoHepi application

get an A value with an average score of 3.48 so that it can be categorized that the media is very suitable for use in learning geography for flood disaster mitigation materials. A complete explanation of the validation results by material experts can be seen in Figure 2.

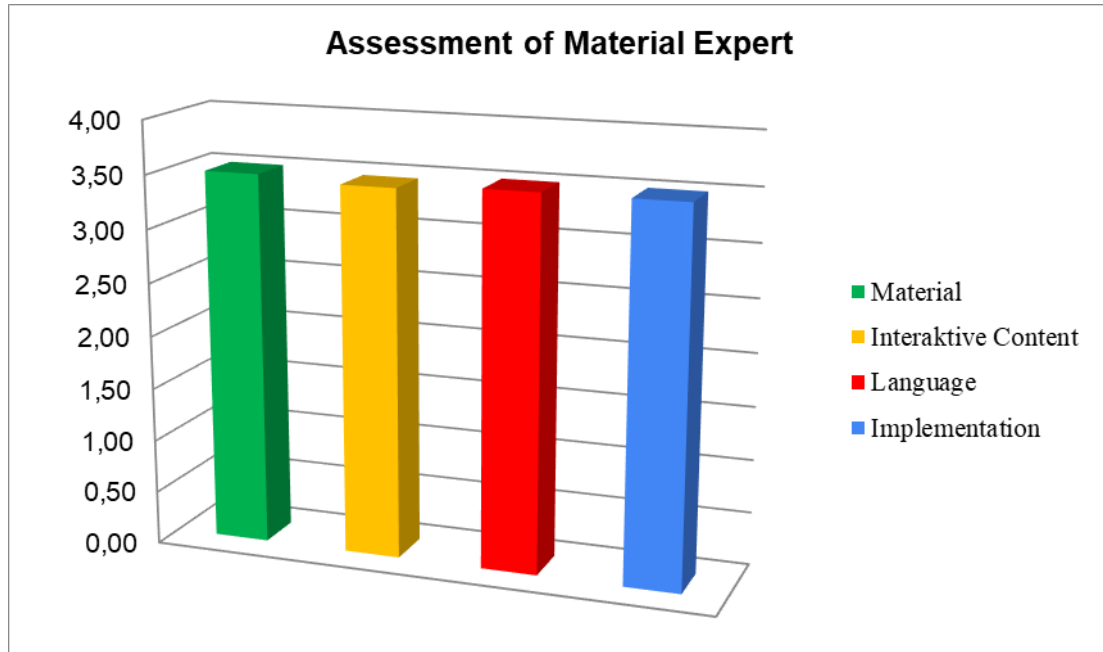


Figure 2. Validation of Material Expert

The GeoHepi media was further validated by two learning practitioners, namely a geography teacher in Kendal Regency from SMA Negeri 1 Kendal and SMA Negeri 1 Gemuh. with the assessment aspects including software engineering, learning design, visual communication and e-learning media. The results of media validation by

geography learning practitioners get an A with an average score of 3.86 so that it can be categorized as very good on learning geography of flood disaster mitigation materials. The results of the validity test by the geography learning practitioners for each aspect can be seen in Figure 3.

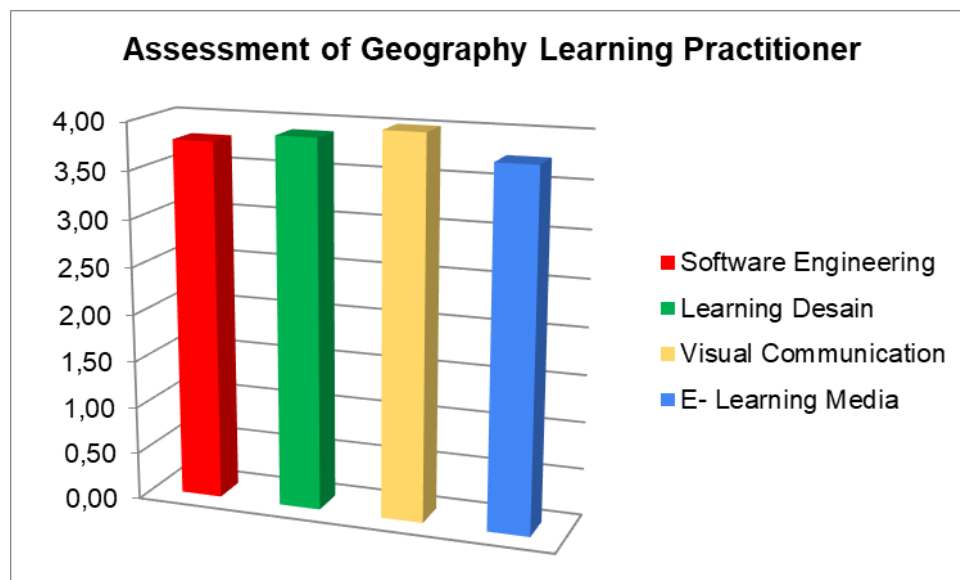


Figure 3. Validation of Geography Learning Practitioner

The trial after the media validation was carried out, the trial of using this media in small classes, the number of students who

took part in this small class test was 25. The aspects assessed on the media by the students consisted of software engineering, learning

design, visual communication, and e-learning media. The results of the assessment of all students in this small-scale trial got a B value with an average score of 3.27 so that it

can be categorized as suitable for use in learning. The results of a small-scale trial with detailed aspects can be seen in Figure 4.

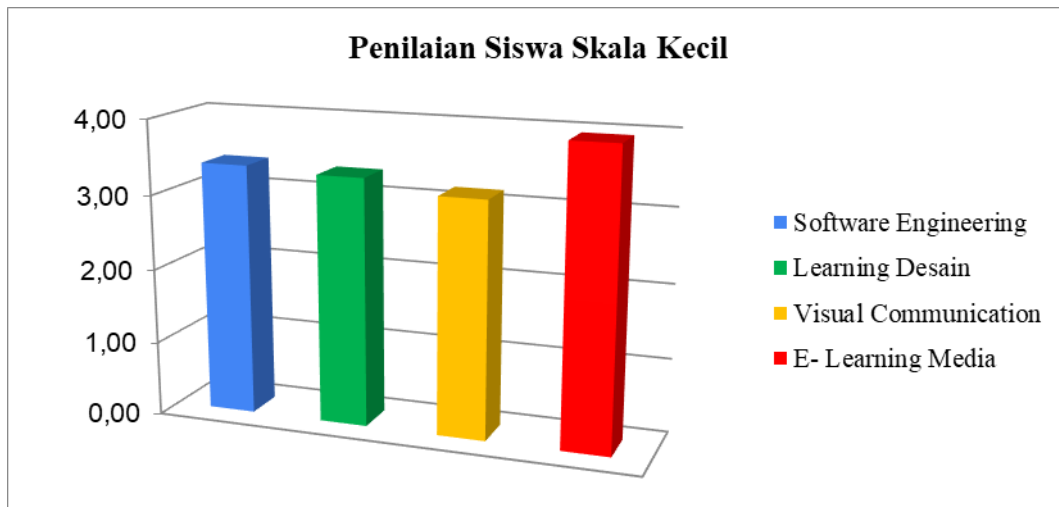


Figure 4. Small-Scale Trial

The next trial phase was carried out on a large scale with the 40 students. The assessment aspect was still the same as the small scale trial. The results of the students' assessment after using the GeoHepi application in large classes got an A with the average score of

3.42 so that it could be categorized as very suitable for use in learning geography for flood disaster mitigation materials. The explanation of student assessment of each aspect in large-scale trials can be seen in Figure 5.

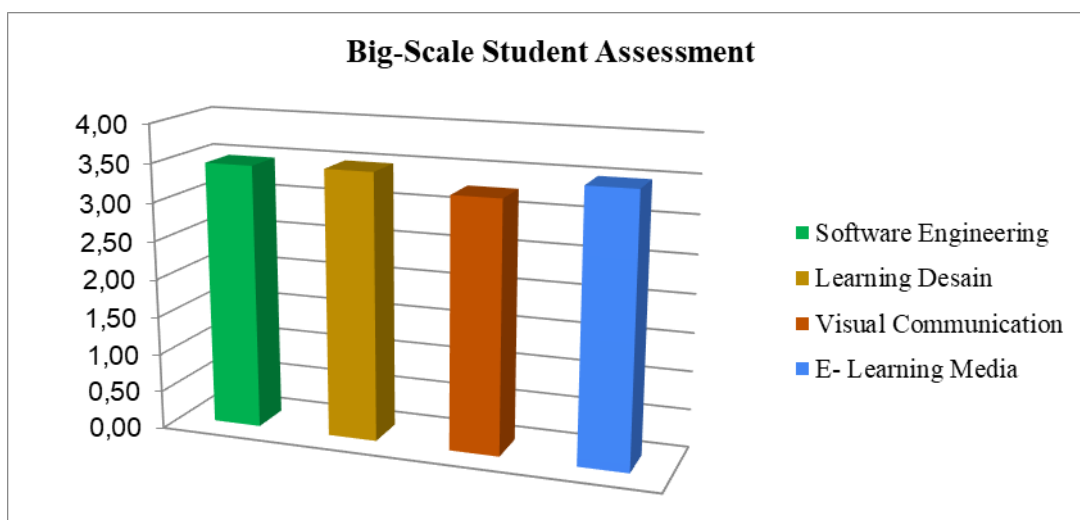


Figure 5. Large-Scale Trial

## DISCUSSION

A renewal in today's learning process is very much needed. The transformation of learning leads to skills in the use of technology, with the aim of increasing digital skills (13). Digital capabilities will be realized in the form of learning assisted by technological

learning media so that teachers must be able to be creative and innovative in making these learning media (14). The selection of the type of technological media developed in this study is an application in the form of a website. With the website, all data is in cloud storage so that the problem of storage

capacity from students' smartphones becomes an obstacle in accessing learning applications (15). The GeoHepi application is in the form of a website so that it can be accessed easily with various devices because it only requires a browser and an internet connection to operate it. This application is equipped with interactive contents in the form of text, image videos with the type of

interactions, image slider, image hotspot, accordion, and interactive video so that students can interact reciprocally with the media, see Figure 6. Interactive media really helps students in the learning process on completing topic or material, improve achievement, motivation and learning outcomes (16–18).



Figure 6. Interactive Content in the GeoHepi Application

The development of the GeoHepi application with interactive content was made for grade 11 flood mitigation materials at Kendal District High School. The Results of application development. In this study, the media validity test was carried out by two experts with the results of the score for each aspect of software engineering 3.71, visual communication 3.69, and e-learning media 4.00 from these three aspects, it can be concluded that the average score is in the very good category. The material expert's assessment on the material aspect is 3.50,

interactive content is 3.45, linguistics is 3.50, and implementation is 3.50 so that the average value is included in the very good category. This good category from material and media experts is because the average value of the media validity test is  $> 3.40$ . The next assessment was carried out by two geography learning practitioners when it is used in learning the results of the assessment of each aspect, namely software engineering 3.79, learning design 3.89, visual communication 4.00, and e-learning media 3.75 so that it can be concluded that the

average is in the very good category because of the value > 3.4. The results of the validation show that the development of the GeoHepi application in the form of a website will be easy to implement because it does not require a special tool to operate it. The current condition is that many students are already using smartphones in learning, because the results of other studies using applications in the form of websites show that visitors are dominated by Android-based smartphones by 74%, thus showing the dominance of using Android in accessing learning websites. (15).

The results of the validation were then carried out on a small scale by obtaining responses from 25 students with assessment aspects consisting of software engineering 3.38, learning design 3.32, visual communication 3.24, and e-learning media 3.16 from From the assessment, it can be concluded that it is in the good category because the average value is between 2.80 to 3.40. The results of these responses were then revised from the media by adding interactive content on interactive video type content to be tested on a large scale. The results of a large-scale trial with 40 students, with the results of the assessment of software engineering aspects 3.45, learning design 3.48, visual communication 3.26, and e-learning media 3.48, from the results of the assessment showed that there was an increase in results. The student assessment was then categorized as very good after revisions were made to the GeoHepi media. The advantage of the GeoHepi application is that users, especially teachers, can create their own interactive content provided in it, so that the creativity of teachers can be developed continuously in providing interactive technological learning media. All responses received an average score of 3.58, these results show that the media is very suitable to use in learning flood disaster mitigation materials at Kendal Regency Senior High School.

## **CONCLUSION**

The problem is the unavailability of interactive learning media with technology on flood disaster mitigation materials in class 11 SMA in Kendal Regency. The development of a website-based application is carried out in the form of GeoHepi which has interactive content in it. The development is carried out in several stages. The analysis phase is carried out to see the analysis of the need for technological media for learning flood disaster mitigation. The next stage of design is done by creating a storyboard from the GeoHepi application. The development stage is carried out by creating a technological learning media, GeoHepi with interactive content in it. The media validation test was carried out by media experts getting an average score of 3.80, material experts getting an average score of 3.48, geography learning practitioners with an average score of 3.86. The trial phase was carried out twice, namely with a small-scale test with an average score of 3.27 student responses and a large-scale test with an average score of 3.42. From the results of the overall average score of the media assessment, it got an average score of 3.58 so that it got an A value which is a very good category for use in learning geography for flood disaster mitigation materials at Kendal Regency Senior High School.

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