

Development of Lumi Education Learning Media Based on H5P for Atmospheric Dynamics Subject at Senior High School 1 Gorontalo

Mohamat Doni S. Matana, Sri Maryati*, Syahrizal Koem

Study Program of Geography Education, Department of Earth Science and Technology,
Faculty of Mathematics and Natural Sciences, Gorontalo State University.
sri.maryati@ung.ac.id

Abstract

The results of observations made at senior high school 1 Gorontalo show that some teachers have not been able to make interactive media so that the teaching and learning process still uses printed books. This study aims to development of Lumi education learning media based H5P on atmospheric dynamics material. The method used in this study is a type of development research with the ADDIE model as an approach in preparing the learning media. This research is conducted using the ADDIE development model, which consists of five stages that is information gathering stage (analysis), planning stage (design), development stage, validation and testing stage, evaluation. The results of this study can be concluded that the development of Lumi education learning media based H5P has passed a validity test by material experts who got a score percentage of 88.3%, the next validator is a product expert validator who got a score percentage of 85.4% and the last by a learning expert validator who gets a percentage of 90% so that it can be used in the learning process in the classroom related to the basic atmospheric dynamics.

Keywords: H5P, Atmospheric dynamics, ADDIE

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**Corresponding Author*

1. Introduction

Education is the result of higher adaptation of human physical and spiritual development, in the awareness of God, as revealed in human emotional, intellectual, and natural tendencies (A. Suryanti et al., 2021). The success or failure of an education can be determined by looking at prior knowledge. If the learning meets the requirements set by the government, it may be considered successful. (Firman & Rahayu, 2020).

Quality human resources require the role of education. This education provides learning experiences to understand thoughts, insights, and self-adaptation for individuals in the process of development (Choimadi & Salamah, 2018). In the era of globalization and Industry 4.0, educators become bridges or facilitators for learners to utilize information and technology to the fullest. One of the real challenges of competency in

the 21st century is that education aims to produce fully competent human resources (Wijaya et al., 2016).

The 21st century is also known as the information era, where all alternative ways to meet life's needs in various places are more information-based. Efforts to fulfill knowledge-based economic development, knowledge-based education, knowledge-based social empowerment, and knowledge-based industrial development are driven by current technological advancements (Mukhadis, 2013).

The government is no longer directly involved in the implementation of education, but schools still need to be able to fund all the facilities required for learning, including the learning environment and learning materials. This can enhance students' motivation to learn (Haryoko, 2010). Skills and knowledge in using learning media are essential for teachers, as it allows them to easily deliver the material, and for students to understand it during the learning process (Otoluwa et al., 2019). The advancement of science and technology has a significant impact, as tools and media are used in the educational environment, such as schools, making the use of online media in a timely manner important to achieve instructional goals (Pranoto, I. & Agraini, 2021).

According to (Rahma, 2019) Learning Media is the way information or messages are delivered from the message source to the receiver or message destination. The utilization of educational media can help students learn more effectively. Learning media stimulates students' thoughts, feelings, attention, and skills or abilities to enhance learning. It serves as a tool for teaching and learning. Learning media is rapidly evolving in the classroom and has an impact on the development of learning psychology and the current education system. This situation also drives and results in an increase in educational technology and the addition of new media (Zaki A., 2020).

Teachers can assist their students in understanding the subjects they learn in class by utilizing media. The importance of media in teaching and learning activities cannot be separated from the goal of education, which is to arouse students' interest and attention (Miftah, 2014). Perspectives are tools and strategies in learning media that are directly related to teaching methods. Media showcases their purpose and what can be achieved that may not be accomplished by a teacher or can be done less effectively (Arsyad, 2002). The benefits of learning media according to (Istiqbal.A, 2018) are mentioned in the learning-teaching objectives as the interaction between teachers and students is facilitated. The purpose is to provide optimal support for learning. The ability to integrate subject teaching, make the learning process clearer and more engaging, create a more interactive learning experience, utilize time and resources more efficiently, improve students' learning outcomes, and make learning accessible anywhere and anytime can be achieved by using media in the classroom (Muhson, 2010).

H5P is a content and learning material in an e-learning Learning Management System (LMS) aimed at facilitating the creation, sharing, and reuse of interactive HTML5 content. Moreover, content is one of the means for online learning, both in terms of its substance and the types of content it offers. Media that can be used includes images, videos, PowerPoint presentations, games, and others, so that H5P can become a much more engaging means of learning and make it easier for users to understand and grasp the material provided in each content. The purpose of developing and implementing H5P content is to capture the users' attention when they access H5P content in online learning. The interactive information and learning materials available in H5P content include interactive videos, interactive PowerPoint files, interactive quizzes, etc., which are hypermedia-based learning tools (Utari et al., 2022).

Hypermedia-based content is an extension of hypertext and multimedia, which combines information in the form of text with images, sounds, videos, or other multimedia elements. Hypermedia is a user interface page that not only displays text but also presents various other multimedia files along with their links. Hypermedia provides interactive information that can be linked to a broader range of media, computer-based multimedia systems that are networked and provide information through links or websites, enabling users to easily access other information (Pinoa & Hendry, 2021).

The physical and technological aspects of the learning environment are crucial for the learning process and can assist teachers in helping students transfer knowledge, making it easier to achieve the established learning objectives (Adam, 2015). Learning media is essential in enhancing the learning process. Media can also increase interest and enjoyment in learning. Audiovisual media is one of the developing learning tools at present (Purwono. Joni, 2014).

Based on the observation results, teachers at Senior High School 1 Gorontalo tend to use printed books and PowerPoint media to deliver the material. The availability of interactive content provided makes it easier for students to understand the given material.

In the context of this research on Interactive Multimedia based on H5P Moodle, this phase involves implementing what has been designed to create a product. The interactive media within H5P Moodle is achieved through the use of course presentations. Within these presentations, there are materials, questions, and videos that align with the content to be delivered. Out of the 32 students who access the e-learning platform once a week as per the predefined schedule, only 29 students actively engage by marking attendance and accessing the interactive media, which includes the provided quizzes. By marking attendance and completing the assigned questions, students receive grades that meet or exceed the Minimum Passing Grade (MPG), which is set at 75. The advantages of using H5P in self-learning are reducing the time needed to complete tasks, minimizing the time required to evaluate or correct user's work, and providing feedback while completing tasks, among others. This research aims to utilize H5P for learning in Senior High School 1 Gorontalo. Therefore, the use of H5P-based media is expected to help create a more effective learning process.

2. Method

This research was conducted at Senior High School 1 Gorontalo in Class X 12. It is an environmentally friendly school and is recognized as one of the top schools with high-achieving students in the Gorontalo City and Regency. Below is the location map of the research, as shown in Figure 1.

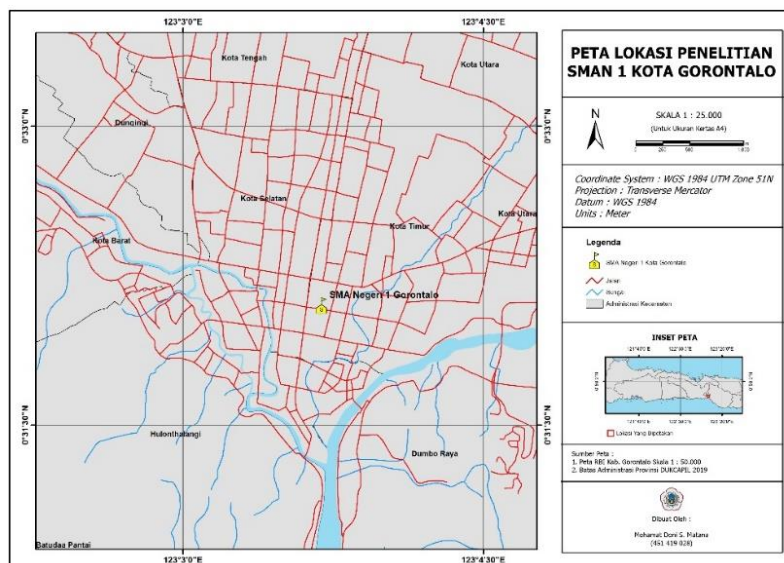


Figure 1. Research Location Map

This research and development aim to produce Lumi Education learning media based on H5P with Atmospheric Dynamics material for Geography subject, conducted at Senior High School1 Gorontalo, Grade X IPS. The developed learning environment can be considered beneficial when it has gone through various stages, such as validation by subject matter experts, media experts, learning experts, and student feedback. This research is conducted using the ADDIE development model, which consists of five stages that is:

1. Information Gathering Stage (Analysis)

In this stage, the researcher conducted initial observations at SMA Negeri 1 Gorontalo. Subsequently, the researcher conducted a literature review to collect relevant materials. The material to be developed is related to Atmospheric Dynamics. During the analysis phase, the researcher collected temporary data related to common issues that arise during the learning process. Following this, the researcher tackled these issues by analyzing the existing needs in accordance with the field's problems. Information was obtained through interviews with teachers and students at SMA Negeri 1 Gorontalo regarding the challenges faced by both teachers and students during the learning process, as well as the materials and media frequently used in the learning process.

2. Planning Stage (Design)

During this stage, the researcher plans everything that will be used in the subsequent phases of the research. The researcher outlines the framework and the systematic development of the educational media while also testing students' capabilities through evaluation activities. The structuring of the educational media framework is done using the Lumi Education application based on H5P. Subsequently, the researcher determines the structure of the educational media by deciding on the sequence of materials to be presented in the media. In this phase, the researcher determines the sequence of presenting the materials in relation to the Atmospheric Dynamics content. The conceptual plan involves presenting Atmospheric Dynamics material in the form of text, images, videos, or a combination of all three, with the aim of engaging students' interest in learning.

In the planning of assessment tools, the researcher selects the type of exercises to measure students' competencies. The types of exercises used in this educational media include multiple-choice questions and multiple-response questions, packaged within the Lumi Education application based on H5P.

3. Development stage

The development stage involves the actual production of the media based on the design plan. In this research, the development stage serves as the media production phase. During this phase, the researcher conducts a review of references and literature sources related to Atmospheric Dynamics. Additionally, materials such as animations, images, audio, and other necessary elements are collected to support the presentation of the learning materials, making them visually appealing and engaging.

4. Validation and testing stage

Validation is carried out by media, material and learning experts. Product revisions from experts. Stages of using learning media products for students at Senior High School 1 Gorontalo. The final result is Lumi Education's H5P-based learning media product with Atmospheric Dynamics material. Implementation is a real step to apply the learning media that we have created according to the target, then this product will be tested at SMA Negeri 1 Gorontalo. Testing is carried out by media experts and material experts. If validation from the experts is complete then the next step is testing by student responses in the form of a trial.

5. Evaluation

The evaluation stage is carried out to see the results produced, starting from the quality of the learning media created based on the prepared criteria.

The data collection procedures carried out by the researcher include: 1) Questionnaire is one of the data collection techniques used in research to obtain information from respondents by providing a set of written statements or questions to be answered. The questionnaire used by the researcher is in the form of a checklist, 2) Interview is a conversation with specific purposes. In this method, the researcher and the respondents meet face to face to obtain information orally with the aim of obtaining data that can explain the research problem, 3) Observation is a data collection technique involving direct observation of an object under study. In this context, observation is conducted to obtain real information or a clear picture of the learning process and the location at Senior High School 1 Gorontalo, 4) Documentation is a technique used to gather and analyze documents, both in the form of images or written materials.

The data analysis technique obtained from the validation results by subject matter experts, media experts, and learning experts, as assessed by geography teachers at Senior High School 1 Gorontalo, will be evaluated based on the criteria indicated in Table 1.

Table 1. Classification Criteria

Score	Criteria
5	Very Suitable
4	Suitable
3	Enough Suitable
2	Less Suitable
1	Not Suitable

source : (Saski & Sudarwanto, 2021)

To determine the percentage result from the data, you should use the percentage formula (Arikunto, 2003) As follows:

$$P = \sum x / \sum x1 \times 100 \%$$

Explanation:

P = Percentage

$\sum x$ = The total score of validator's answers (actual score)

$\sum x1$ = The total score of the highest expected answers (expected score)

100% = The constant number.

The result obtained from the percentage calculation will be used to determine the level of suitability of a product from the development outcomes. The determination of the product's suitability level can use qualifications that have criteria as indicated in Table 2.

Table 2. Qualification of Suitability Level.

Percentage	Qualification	Kriteria Kelayakan
81%-100%	Very Suitable	Not revision
61%-80%	Suitable	Not revision
41%-60%	Enough Suitable	Required revision
21%-40%	Less Suitable	Revision
0%-20%	Not Suitable	Revision

Source: (Saski & Sudarwanto, 2021)

3. Results and Discussion.

This media research and development aims to produce H5P-based Lumi Education learning media with Atmospheric Dynamics material in the Geography subject held at Senior High School 1 Gorontalo Class X IPS. The learning environment developed can be declared useful if it has gone through various stages, such as the results of validation by material experts, media experts, learning experts and student responses and the results obtained are shown in Figure 2.

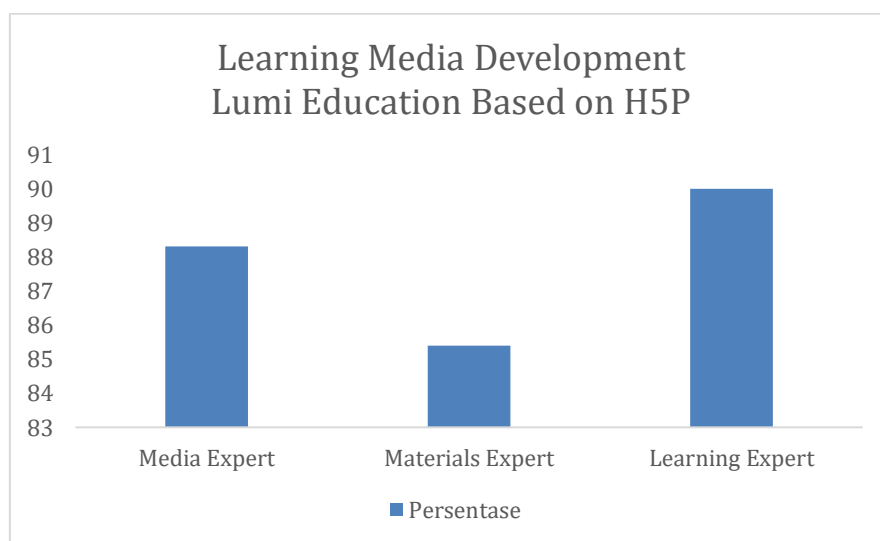


Figure 2. Percentage of Lumi Education Media Based on H5P

Based on the needs analysis conducted through direct interviews with students and geography teachers at Senior High School 1 Gorontalo, it was found that the Atmospheric Dynamics topic in Geography subject requires the use of learning media. From the analysis of the use of learning media through direct interviews, it was obtained that the use of media in learning at Senior High School 1 Gorontalo is highly needed because the current learning process still relies on printed books as teaching aids. This has resulted in less optimal or unsatisfactory performance for Grade X IPS students. Geography lessons for Grade X IPS at Senior High School 1 Gorontalo are conducted twice a week. The total number of active students in Grade X IPS is 432, divided into 12 classes.

Based on the researcher's observation, the learning facilities available at SMA Negeri 1 Gorontalo are adequately provided, such as the availability of geography textbooks, WIFI, LCD projectors, and computers. However, the teaching and learning process in this school still relies on printed books due to the limited number of LCD projectors, which need to be shared among teachers. Based on the aforementioned issue, there is a need for the development of learning media for the Geography subject, particularly for the Atmospheric Dynamics topic.

The framework of the program serves as an overview and comprehensive scope for developing Lumi Education learning media based on H5P for the Atmospheric Dynamics subject. The researcher utilizes this framework to guide the development of the learning media, ensuring it aligns with the specific goals and objectives of the curriculum. The following pictures of learning media planning are shown in Figure 3:

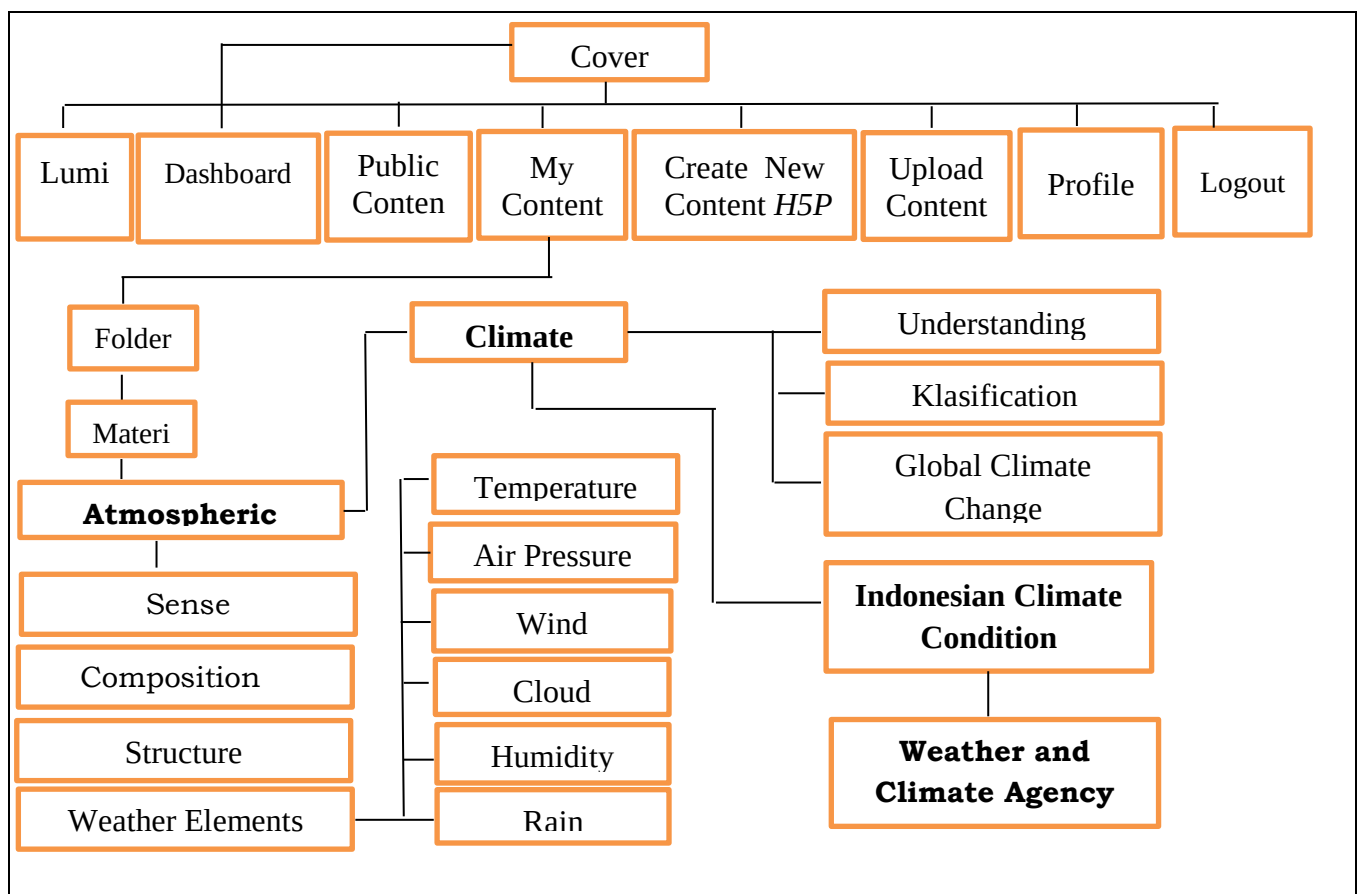


Figure 3. Learning Media Planning

The learning media is created and designed based on the provided steps to produce the Lumi Education Learning Media based on H5P for the topic of Atmospheric Dynamics. This resource resembles the layout of social media platforms like Facebook and classroom interfaces. This online learning media can be accessed anytime and anywhere as long as there is an available network and internet connection. It is equipped with various features to enhance the learning experience. The appearance of the learning media is similar to that of the social media platform Facebook, making it easy for students to access. All learning materials are presented in various formats, including videos, PowerPoint presentations, and document files. This enables students to simply click on or download the materials they need for their studies. Additionally, students can access learning materials, practice questions, and attendance records through provided links. This user-friendly and accessible approach to learning can enhance students' learning experiences and engagement with the material. The appearance of H5P-based Lumi Education learning media is shown in Figure 4:

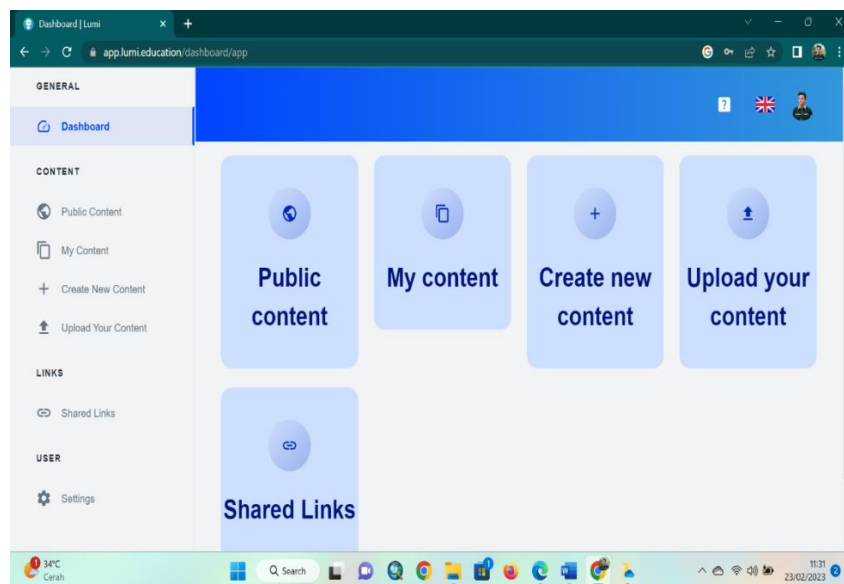


Figure 4. Display of Lumi education learning media

The Lumi Education Learning Media based on H5P is very user-friendly and easy to use for both teachers, students, and parents, without requiring any specific expertise in using the application. The interface of the application is designed to be similar to the social media platform Facebook, making it already familiar to students. The material menu interface in the Lumi Education Learning Media based on H5P is shown in Figure 5.

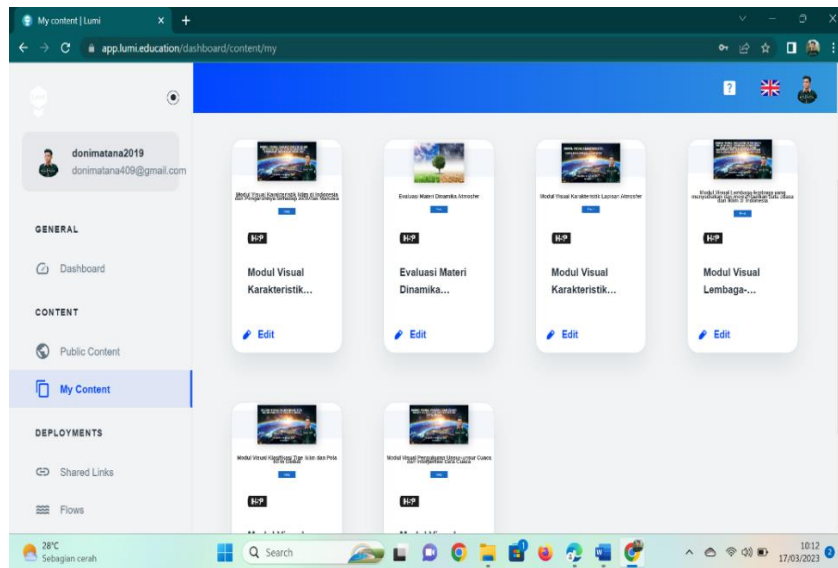


Figure 5. Page of Material

The material menu already contains several learning materials presented in the form of explanatory videos, PowerPoint presentations, and document files. This makes it easier for students to listen to and understand the explanations of the materials provided. With this type of learning, it is hoped that students will not easily feel bored and unengaged. Instead of just reading and listening, they can now watch the instructional videos presented by the teacher.

The assignment menu in the Lumi Education Learning Media based on H5P is very user-friendly and easy to use for both teachers, students, and parents, without the need for any special expertise in using the application. The appearance of the assignment menu is already familiar among students and teachers. The assignment menu in the Lumi Education Learning Media based on H5P is shown in Figure 6.

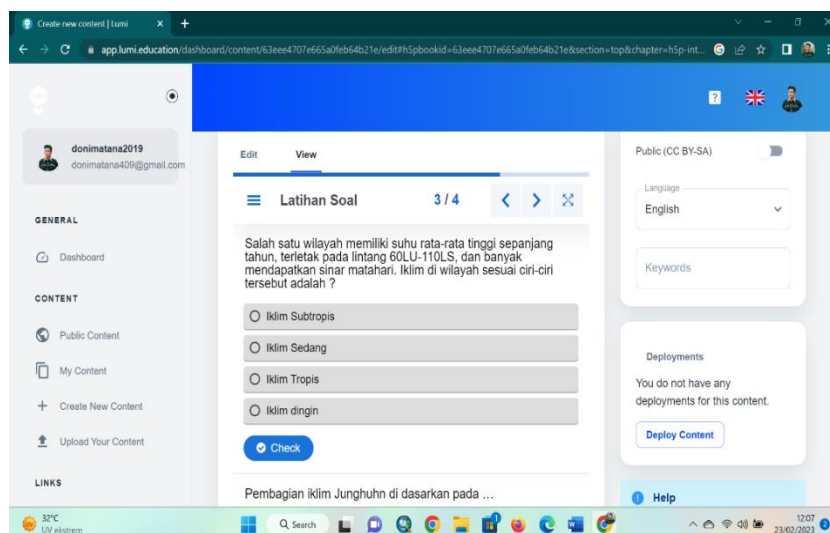


Figure 6. Task Page

In this assignment page, students can access the "Home" menu where they simply need to click on the "Student Assignment" view to start working on the tasks given by the teacher. These tasks can be done individually. The assignments or exercises already

contain instructions or working procedures that students can read and understand before starting the tasks, and there are questions that students must answer.

The development of the Lumi Education learning media on the topic of Atmospheric Dynamics based on H5P was carried out in several stages, including the validation and review stage, which serves as one of the prerequisites for scientific authorization. The Lumi Education learning media based on H5P has been validated by media experts, subject matter experts, and learning experts. The data obtained from the validation results consist of two types: quantitative data and qualitative data, which were gathered through the validation tools provided during the product validation. Quantitative data can be in the form of scaled questionnaires, while qualitative data can include additional assessments and feedback from the validators during the product evaluation. The experiment was conducted by introducing the media to each student, which was directly facilitated by the researcher. After using the learning environment, students were given questionnaires to fill out in order to evaluate the functionality of the developed learning environment.

Based on the assessment from the product design expert on the developed Lumi Education learning media based on H5P, the validation percentage resulted in 85.4%. According to the validity scale table, achieving a percentage of 85.4% indicates that the learning media is highly valid, and there is no need for further revisions.

Based on the assessment from the subject matter/content expert on the Lumi Education learning media based on H5P, the initial validation percentage resulted in 66.6%, indicating that it is moderately valid and requires revisions. This means that there were some corrections and input suggestions from the subject matter/content expert to improve the media. For instance, the arrangement of the Atmospheric Dynamics material and explanations should be made shorter and more understandable. Additionally, the material needs to be aligned with the learning indicators, and the evaluation for the Atmospheric Dynamics material should be created separately and accompanied by high-definition (HD) images.

The student responses obtained from the questionnaire will be analyzed in terms of percentages and qualifications to draw conclusions about whether the development of the learning environment with Lumi Education application based on H5P can enhance learning motivation related to the Atmospheric Dynamics material. Based on the data obtained from the student survey, it is known that the average rating of the Lumi Education learning environment based on H5P is 87% with the criteria of being highly valid.

The Lumi Education learning environment based on H5P is developed in its production version. The product evaluation phase is where the validation results in feedback, suggestions, and the final outcomes of the testing process. During the product updating process, the researcher considers the contributions of the validators to improve the product, resulting in a beneficial product based on the feedback and recommendations from the validators.

It is hoped that the next development of similar research can be further developed with subjects related to geography learning and focus more on material designed to be more complete and varied so that students are more interested in using H5P-based Lumi Education and are better able to take advantage of the sophistication of the development of the digital world in the era of globalization. At the moment.

4. Conclusion

Based on the research results, the validation scores obtained from product design expert were 85.4% (highly valid), from subject matter/content expert were 88.3% (highly valid), and from subject teacher validation were 90% (highly valid). The evaluation score from students for the Atmospheric Dynamics material was 89%, and the average response from students towards the Lumi Education learning media based on H5P was 87%. Therefore, the Lumi Education learning media based on H5P for the Geography subject, specifically the Atmospheric Dynamics material, at Senior High School 1 Gorontalo is considered to be eligible (Good) and suitable for use in both offline and online learning processes.

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