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WEBSITE-BASED TEACHING MATERIALS DEVELOPMENT IN INFORMATION AND COMMUNICATION TECHNOLOGY SUBJECTS AT IPIEMS SURABAYA HIGH SCHOOL

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ABSTRACT

This research aims to produce a product in the form of learning media, namely web-based learning media with Google Sites as a site creation tool. Then a media validation test was carried out to determine the feasibility and practicality of Google Sites web-based learning media in senior high school (SMA) Information and Communication Technology (ICT) learning. This type of research is development research with the ADDIE model which consists of five stages, namely, analysis, design, development, implementation and evaluation. Data collection techniques using questionnaires. The validator test results consist of six validators, namely, the content expert feasibility validator obtained an average percentage of 90%, the media expert feasibility validator obtained an average percentage of 95%, and the design expert feasibility validator obtained an average of 95%. The results of the content expert practicality validator test obtained an average percentage of 89%, the media expert practicality validator obtained an average percentage of 96.6%, and the design expert practicality validator obtained an average percentage of 96%. The results of small group trials obtained an average percentage of 82.9% and the results of large group trials obtained an average percentage of 81.8%. Based on the data that has been obtained, it can be concluded that learning media based on the Google Sites website for learning Information and Communication Technology (ICT) class 10 in Senior High Schools (SMA) is suitable for use in learning activities.

KEYWORDS *Website, Information And Communication Technology Subjects, Learning Media*

INTRODUCTION

Information and Communication Technology is a technology that includes all technical equipment for processing and delivering information. The term Information and Communication Technology as well as advances in information technology make humans deal with other parties as if they are no longer limited by time and place. Whenever and wherever, humans with these technological devices

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can establish relationships, obtain information, and disseminate information to others (Roza et al., 2023).

Informatics is the field of study, design, and manufacture of computing systems, as well as the principles that underlie this design. Computing is the science of mathematical modeling and the use of computers to solve scientific problems. The term informatics is equivalent to the terms Informatics, Computing, or Computer Science in English. Informatics covers the modeling of "computing" and its application in the development of computer systems. What is computing? According to the National Dictionary of the Indonesian Language, computing is: 1). calculation using a computer; 2). in mathematics, calculation using numbers or variables carried out based on a given sequence of steps (Musthofa, 2021).

Informatics in the Industrial Era 4.0 Today humans live in a digital era that is often called Industry 4.0. In industry 4.0, many things are done by humans utilizing computer-based intelligent machines and the internet. Today's society is called society 5.0 because it lives in the physical world as well as in the cyber world when carrying out online activities. Humans carry out many activities physically and online with the use of computer and internet technology. You can certainly remember your experiences of activities supported by computer and internet technology, from communicating on social media, playing online games, ordering food, ordering transportation, enrolling in school, studying online, and so on (Musthofa, 2021).

The development of Information and Communication Technology makes it easier for humans to access information anytime and anywhere. One of the developments of ICT is used in the field of education, such as the development of online learning. A website is a learning process that requires information technology, in this case using online media such as the internet as a method to provide interaction and convenience. Technology in education can boost the performance and creativity of learners. More learning information can help learners achieve their learning goals during the learning process. Therefore, a learning strategy must be in place, including the use of technology as a teaching tool. Educators can utilize technology to create learning media that can be used during class. Educators must create innovative learning media for students to increase their engagement with the material being taught. In the technological era, learning is no longer centered on educators or learners, but on learners (Nafeesa and Mulyani, 2023).

Moreover, development in the context of education and teaching material development is not a static process, but a dynamic one that requires continuous adaptation and revision to meet the ever-changing needs and challenges in education. Therefore, development in education and teaching material development is very important and needs more attention in an effort to improve the quality of education and student learning outcomes (Atiqoh, 2023).

Learning media are tools used to demonstrate certain facts, concepts, principles, or procedures so that they appear more real/concrete. These tools are intended to provide a more concrete experience, motivate, and improve students' absorption and memory in learning. Media can encourage positive attitudes of students towards learning materials and processes. The learning process becomes

more interesting if the right media is used so that students are motivated to love the knowledge they are learning. An educator can be efficient and effective in delivering material if he or she can use media properly. The use of media in learning will affect time efficiency so that educators have enough time to pay attention to helping students who experience learning difficulties, shaping personality and motivating learning (Dwi Herlina, 2020).

The rapid development of science and technology has both positive and negative impacts. The development of science and the world of technology has proven to have a positive impact, with increased openness and the spread of information around the world. The negative effects are changes in values, norms, rules, and morals that conflict with what already exists. Society's life is constantly changing as a result of advances in science and technology, including education. Education must anticipate these changes in order to prepare human resources that are able to compete in a global society (Roza et al., 2023).

Seeing this condition, the world of education must of course undergo development both in terms of learning and learning facilities. Not only the development of the educational superstructure, but also the infrastructure. Not only developing school buildings and school facilities, but also the development of educational technology.

Learning must be fully developed, not only in terms of subject matter. However, there are things that attract students' attention to the spirit of participating in lessons, for example, how to package learning methods and learning models. Learning packaging must be developed, learning models must also be updated, and even more so the latest sources of material.

Seeing this condition, learning media through websites is in high demand among students in their daily lives. Therefore, there needs to be direction on how to use these online media for more useful things. So, development is needed in relation to website-based teaching resources to make it more interesting for students to undergo learning. The teaching and learning process is easier and more enjoyable to implement.

One of the learning resources that can be developed is teaching materials. The teaching materials are comprehensive enough to be used by students to follow the learning process. In website-based teaching materials, it is possible to include material and create evaluation sheets. The researcher feels that this is more appropriate because the learning resources that students use besides books are teaching materials. So there is a need to develop these teaching materials.

This study explains the role of website-based teaching materials using Google Sites. With regard to the media used, the researcher used a website developed by Google LLC, namely Google Sites, which is a website specifically designed to create websites that can be used, among other things, to create learning media for educators. Google sites is a product of Google that functions as a tool for creating websites, where users can utilize Google sites because they are easy to create and manage by ordinary users. Google sites can also integrate with links to materials or questions that educators create for students, so that Google sites can also be used as a learning management system (LMS). So Google sites are very suitable if used by researchers in teaching materials and to engage students in fun learning.

RESEARCH METHOD

This research uses a development research method with the ADDIE model which includes 5 stages. The first stage is analysis, where researchers will review and identify the needs required. The second stage is design, where researchers will design products or learning media that contain elements found in the analysis stage. The third stage is development, where researchers will realize the design that has been made. The fourth stage is implementation, where the learning media that has been made will be applied in the teaching and learning process. The last stage is evaluation. This research involved 30 students from class X SMA IPIEMS Surabaya.

The data collection instruments used in this study consisted of seven types of sheets, including:

a. Content expert feasibility validation sheet;
b. Media expert feasibility validation sheet;
c. Design feasibility validation sheet;
d. Content expert practicality validation sheet;
e. Media expert practicality validation sheet;
f. Design expert practicality validation sheet; and
g. Small and large group trial sheets.

All data obtained will be calculated using the following formula:

Eligibility Formula: $Persentase\ Kelayakan = \frac{skor\ yang\ diperoleh}{skor\ yang\ diharapkan}$ X 100%

Description:

Table 1 Feasibility Percentage Value

Percentage (%)	Feasibility Category
< 21	Very Unfit
21 - 40	Not Feasible
41 - 60	Decent Enough
61 - 80	Worth
81 - 100	**Very Feasible**

Practicality Formula: $Nilai\ Praktikalitas = \frac{skor\ yang\ diperoleh}{skor\ maksimal}$ X 100%

Description:

Table2 Practicality Percentage Value

Score	Practicality Criteria
86% - 100%	Very Practical
76% - 85%	Practical
60% - 75%	Practical enough
55% - 59%	Less Practical
≤54%	Not Practical

Group Trial Formula : $P = \frac{\sum x}{n}\ x\ 100\%$

Description:

P : Results

$\sum x$: Total Score
n : Maximum Score

Based on the criteria in the formula and table above, learning media is considered very practical and valid if it is included in the good or very good criteria. To test the feasibility and practicality of learning media, this study will use a questionnaire sheet to validators and students.

RESULT AND DISCUSSION

Discussion

This research was conducted in class X Merdeka at Ipiems Surabaya High School. The development of this interactive learning media was carried out using the ADDIE development model, which consists of five development stages, namely: (1). Analysis stage (*analysis*); (2). *Design* stage; (3). *Development* stage; (4). *Implementation* stage; and (5). *Evaluation* stage.

a. Analysis

The development of this learning media is carried out with the aim of providing effective learning at Ipiems Surabaya High School in Information and Communication Technology (ICT) subjects with material on advanced features of office applications, data storage in the environment for *cloud* class X Merdeka. At this stage, needs analysis activities are carried out which include four things, namely: (1). Analysis of learner characteristics; (2) Learning problems; (3) Competency analysis; and (5) Facility analysis.

b. Design

Designing learning media is done through four stages, namely:

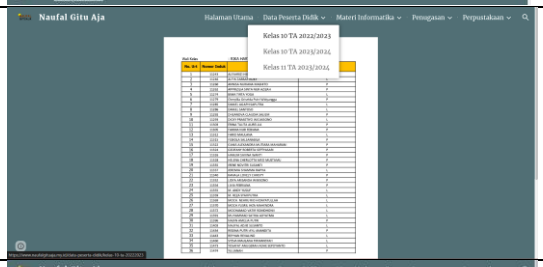
- Designing UI/UX;
- Develop Media Assessment Instrument; and
- Design the flow of learning objectives.

c. Development

This stage is the production stage in developing products in the form of learning media from design to actual products in accordance with the UI/UX that has been designed. First by collecting teaching materials and materials, as for the relevant material in class X Merdeka at the high school level.

At this stage, the development of learning media from UI/UX is then developed into actual products. At this stage, the product will be produced in the form of learning media. The first activity carried out at this stage is collecting materials in making learning media, for example: images related to the material, e-books, or videos.

Images and videos are developed then can be seen on the website as a place of learning media. All materials that have been collected can be accessed through the media website www.naufalgituaja.my.id. The following is the display of learning media development results.

No.	Image	Description
1.		Media Start View
2.		Learner Attendance List Display
3.		*Web-based* Material Display
4.		Canva-based Assignment Place View
5.		Assignment Place Home View
6.		Task Collection Design View

d. Implementation

At this stage the activity carried out is to implement the media. Implementation in this case is intended to test the validity of the feasibility and practicality of the product that has been developed. Some stages of product implementation are as follows:

- Product validation by experts consisting of media experts, content experts, and media experts; and
- Product trials included: (a) small group trials with ten (10) students and large group trials with 20 students. The difference in student learning outcomes on the score list owned by the grade X teacher. The purpose of conducting this product trial is to determine the validity of the learning media that has been developed.

e. Evaluation

The evaluation stage is carried out with the aim of validating the learning media products that have been developed through expert testing. At each stage of the development of this learning media, evaluation and revision are carried out to improve the resulting product.

Results

The results of the data analysis will be presented eight (8) of them: (a) content feasibility expert test; (b) media feasibility expert; (c) design feasibility expert; (d) content practicality expert; (e) media practicality expert; (f) design practicality expert; (g) small group test; and (h) large group test. The results of the data analysis are presented as follows:

Table 3. Product Trial Results

No.	Test Subject	Validation
1.	Content Appropriateness Expert	90%
2.	Media Kayalakan Expert	95%
3.	Design Feasibility Expert	95%
4.	Content Practicality Expert	89%
5.	Media Practicality Expert	96.6%
6.	Design Practicality Expert	96%
7.	Small Group Test	82.9%
8.	Large Group Test	81.8%

f. Content Expert Feasibility Evaluation Results

Based on the acquisition and *review* by content experts, calculations are carried out by finding the average overall score by content experts adjusted to a five (5) scale convection table. The results of the assessment from the content expert obtained an average score of 90%, it can be deduced that the learning media product is very feasible based on the *review* by the content expert.

g. Media Expert Feasibility Evaluation Results

Based on the acquisition and review by media experts, calculations are carried out by finding the average overall score by material experts adjusted to a five (5) scale convection table. The results of the assessment from the media expert obtained an average score of 95%, it can be deduced that the learning media product is very feasible based on the review by the material expert.

h. Design Expert Feasibility Evaluation Results

Based on the acquisition and review by design experts, calculations are carried out by finding the average overall score by design experts adjusted to a five (5) scale convection table. The results of the assessment from the design expert obtained an average score of 95%, it can be deduced that the learning media product is very feasible based on the review by the design expert.

i. Practicality Evaluation Results of Content Experts

Based on the acquisition and review by content experts, calculations are carried out by finding the average overall score by content experts adjusted to a five (5) scale convection table. The results of the assessment from the content expert obtained an average score of 89%, it can be deduced that the learning media product is Very Practical based on the review by the content expert.

j. Media Expert Practicality Evaluation Results

Based on the acquisition and review by media experts, calculations are carried out by finding the average overall score by media experts adjusted to a five (5) scale convection table. The results of the assessment from media experts obtained an average score of 96.6%, it can be deduced that the learning media product is Very Practical based on reviews by media experts.

k. Practicality Evaluation Results of Design Experts

Based on the acquisition and review by design experts, calculations are carried out by finding the average overall score by design experts adjusted to a five (5) scale convection table. The results of the assessment from the design expert obtained an average score of 96%, it can be deduced that the learning media product is very practical based on the review by the design expert.

l. Small Group Trial Results

Based on the results of obtaining data from the small group test review, calculations were carried out by finding the average score of the entire small group trial. The results of the small group test obtained an average score of 82.9% with a predicate category of Very Practical.

m. Large Group Trial Results

Based on the results of obtaining data from the small group test review, calculations were carried out by finding the average overall score of the large group trial. The results of the large group test obtained an average score of 81.8% with a predicate category of Very Practical.

CONCLUSION

The development of website-based learning media provides many benefits for modern education. By using this technology, learners can access learning materials flexibly and independently. This medium also allows the integration of various multimedia formats such as text, images, audio, and video to improve learners' understanding. In addition, the interactivity provided by the website can increase student engagement in the teaching and learning process. Thus, the use of website-based learning media is an effective solution to support more dynamic, interactive, and comprehensive learning in this digital era.

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