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Development of Virtual Tourism-Based Interactive Multimedia in Tourism Geography Learning

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ABSTRACT

The objectives of this study included (1) Designing products in the form of interactive multimedia based on virtual tourism; (2) Analyzing the theoretical feasibility test of experts in the development of interactive multimedia based on virtual tourism; (3) Analyzing the empirical feasibility test of interactive multimedia based on virtual tourism. The present study employed a Research and Development design. The data analysis techniques were qualitative and quantitative descriptives. The findings revealed that (1) The design of interactive multimedia based on virtual tourism in the Tourism Geography course consisted the pages of login, introduction, main menu, module instructions, materials, and info; (2) Virtual tourism-based interactive multimedia developed was declared highly feasible by media experts and practitioners, and it was considered worthy of development by material experts; (3) Virtual tourism-based interactive multimedia, according to students, was very suitable for use in learning activities. The implications of this research emphasized subsequent researchers' need to develop materials displayed in a much better interactive multimedia based on virtual tourism.

Keywords: Interactive Multimedia as Learning Media, Virtual Tourism, Learning Media Development

1. INTRODUCTION

21st-century learning prepares the generation facing the rapid growth of Information and Communication Technology (ICT), affecting various aspects of life, including the teaching and learning process (Budiaman et al. 2019). Technology influences innovations that change learning patterns and media (Bali, 2019; Deskoni, 2011; Putra, 2017; Saputro & Saputra, 2015). Hence, learning innovation arises from a paradigm shift (Salsabilla et al. 2020). In addition, global demands require education to constantly adjust technological developments to improve quality, especially using ICT in the learning process (Prayogi et al., 2019; Rusman, 2010). The change in the learning paradigm begins with reflecting on the old paradigm experiencing anomalies, leading to a new hypothesis to break down educational problems.

The Geography Education Study Program is one of the study programs at the Faculty of Teacher Training and Education, University of Lampung. There is a Tourism Geography course with two credits in its curriculum. This course contains one competency standard broken down into four basic competencies. Three basic competencies comprise theories of tourism, definitions, objectives, functions, principles, and theories of tourism management from a spatial point of view. Meanwhile, another basic competency contains twenty-four procedural knowledge that requires concepts and experience for students to master. Tourism Geography also examines tourist activities, objects, facilities, and supporting factors (Hendra et al., 2021). Mastering the Tourism Geography course materials is essential because the graduates of geography education are expected to become educators. However, regarding classroom management, the teaching and learning process indicates

that lecturers tend to be centered as the primary resource.

The learning of the Tourism Geography course is still limited to lectures or in-person discussions. Moreover, multimedia application to support the understanding has not been available. Lecturers are less creative in developing media and have not utilized technology in learning. As a result, multimedia teaching materials as a learning medium for the Tourism Geography course are not used. These problems imply less optimal student learning outcomes. Therefore, Geography education lecturers should no longer merely teach as an activity to convey knowledge, skills, and attitudes to students. Learning is expected to be more meaningful or valuable if lecturers can use methods to foster students' creative ideas (Utanto et al. 2017). Tourism learning in Geography should require students to develop their knowledge and independent learning while lecturers act as facilitators, mediators, and managers of the learning process (Selegi & Hartono, 2019). Based on the statement above, researchers attempted to make this study innovative on the investigated topic.

This research provided novelty related to the Development of Interactive Media based on Virtual Tourism in Geography learning, considering that multimedia-based learning makes the application of learning media very much needed not only as a tool but as an additional supplement so that the learning process is not centered on teachers (Yuliana et al. 2022). Meanwhile, the objectives of the study included (1) Designing interactive multimedia based on virtual tourism; (2) Analyzing the theoretical feasibility test of experts in the development of interactive multimedia based on virtual tourism; (3) Analyzing the empirical feasibility test of interactive multimedia based on virtual tourism.

2. LITERATURE REVIEW

2.1 Interactive Multimedia as a Learning Medium

Interactive multimedia is very diverse, adapting to the platforms used and the development of multimedia application technology itself. Interactive multimedia means the user can see, hear, and interact with the media (Herdiyanto et al. 2020). According to Sutopo (2009), multimedia objects are divided into text, image, animation, audio, video, and interactive links. Thus, it is commonly known as a wide variety of graphics, text, sound, video, and animation combinations. This merger is a unity that displays information, messages, and lesson content (Arsyad, 2014).

Nandi (2006) also defines that there are three interactive multimedia models in learning, namely 1) the Tutorial model, 2) the Drills model, and 3) the Simulation model. Delismar et al. (2013) generally emphasize that the criteria for suitable multimedia teaching materials include that the material presented must be interactive, indicating that it allows learners to participate actively through problems and questions designed in teaching materials.

2.2 Virtual Tourism

Osman et al. (2009) convey the understanding of virtual tourism as a tour activity that utilizes technology by placing users in images and allowing them to increase situational awareness and significantly improve the visibility to capture and analyze virtual data. In its development, virtual tours in tourism activities meet the increasing need for tourist experiences (Chiao et al. 2018). The virtual tour simulates an existing location, usually consisting of videos or images (Yuliana & Lisdianto, 2017). It can also involve other multimedia elements such as sound effects, music, narration, and text. The *virtual tour* is often used to describe videos and panorama-based photographic media showing an unbroken view. Hence, the panorama can be a series of photos or panning video recordings.

2.3 Development of Learning Media

Learning media development is an effort to prepare a learning media program that focuses on media planning. The media

displayed in the teaching and learning process is initially planned and designed according to the field's or students' needs (Usman, 2002). Therefore, media needs to develop continuously and adapt to technology and student needs, making it easier to help students understand. Setyosari (2016) also defines the need to develop a learning model into conceptual and procedural models. Several learning media development models for interactive learning multimedia programs can be used as a reference in developing interactive multimedia products. They include the Allesi & Trollip model' (Alessi & Trollip, 2001), the Lee & Owens model (Lee & Owens, 2004), and the Borg & Gall model (Gall et al. 2008).

The most common development model is the Borg & Gall model, which consists of ten stages of development. On the other hand, Sadiman et al. (2003) put forward the sequence of steps to be taken in developing a media program, including (1) Analyzing the needs and characteristics of students; (2) Formulating instructional objectives operationally and clearly; (3) Formulating detailed grains of material to support the achievement of goals; (4) Developing measuring instruments; (5) Writing a script; (6) Conducting tests and revisions.

3. METHOD

3.1 Research Design

The method used in this study was Research and Development, aiming to produce specific products and test their effectiveness (Sugiyono, 2010). The ultimate goal was to produce new products or improve old ones to enhance education quality. It was expected that the educational process would be more effective and more aligned with the field's needs (Juliana et al. 2017).

3.2 Research Procedures

The procedure stages included several development steps because the method used was in the form of Research and Development. The development procedure employed the Gall & Borg Model (Gall et al. 2008) development model with seven steps illustrated in Figure 1.

3.3 Research Samples

The research subjects were the Geography Education study program students at the University of Lampung, Indonesia. Specifically, those who took the Tourism Geography course consisted of a limited sample of 6 students and a small group trial of 12 students.

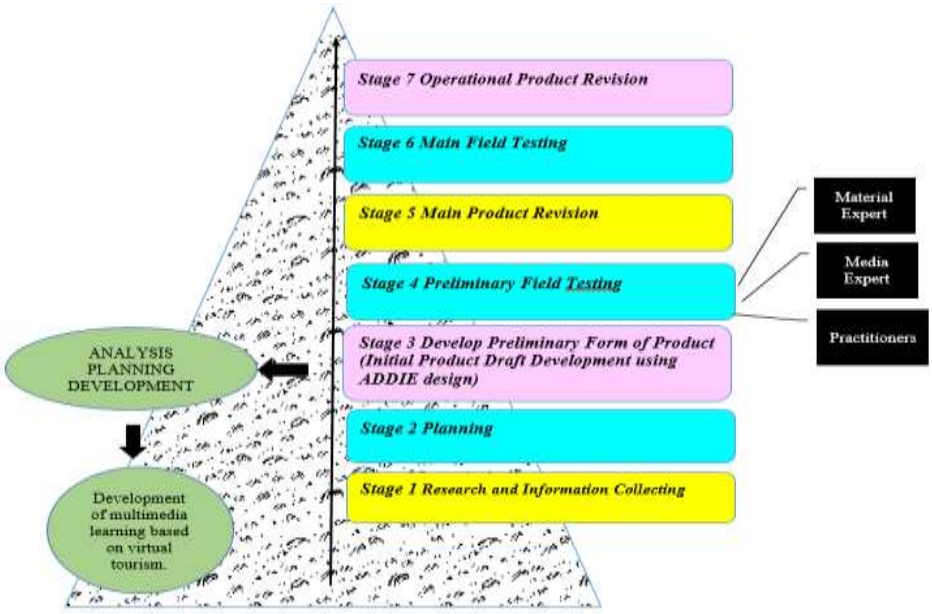

Figure 1. Modification of Development Model Steps

3.4 Research Instruments

The instruments used in this study were validation sheets by material experts, validation sheets by media experts, validation sheets by practitioners, and student assessment sheets. The assessment criteria for learning media are presented in Table 1.

Table 1. Learning Media Assessment Criteria

No	Assessment Aspects	Indicators
1	Content Quality and Purpose	Accuracy Importance Completeness Balance Interest/attention Justice Suitability to the student's situation
2	Instructional Quality	Providing learning opportunities Providing learning assistance Motivational qualities Instructional flexibility Connection with other learning programs The social quality of instructional interaction The quality of test and assessment Having an impact on students Having an impact on teachers and learning
3	Technical Quality	Readability Easy to use View/impression quality Quality of answer Quality of program management Quality of documentation

Source: Adaptation theory of Walker & Hess (1984)

3.5 Data Analysis Techniques

The analysis techniques aimed to collect data on the feasibility of Interactive Multimedia in the Tourism Geography course. More details are presented in Table 2.

Table 2. Research Data Analysis Techniques

Research Objectives	Data Collection Techniques	Data Sources	Data Acquisition	Data Analysis Techniques	Instruments
Designing products in the form of interactive multimedia based on virtual tourism	Descriptive	Lecturer	Needs Analysis	Qualitative Descriptive	Descriptive
	Documentation	Programming Design Draft	Articulate Storyline software	Qualitative Descriptive	Descriptive
	Documentation	Virtual tourism-based interactive multimedia product developed using the Articulate Storyline software	Pre-Production, Production, and Post-Production Activities	Qualitative Descriptive	Descriptive
Analyzing the theoretical feasibility test of experts in developing interactive multimedia based on virtual tourism	Assessment Sheet Questionnaire	Material Expert	Expert Validation of Content/Material	Descriptive Quantitative by measuring the validity of content based on developed theories (Lawshe, 1975)	The Ordinal Scale converted to a Likert Scoring scale (Arikunto, 2019): Perfectly Valid: 5; Valid: 4; Adequately Valid: 3; Less Valid: 2; Invalid: 1
	Assessment Sheet Questionnaire	Media Expert	Media Expert Validation		
	Assessment Sheet Questionnaire	Practitioners	Practitioner Validation		
Analyzing the empirical feasibility test of interactive multimedia based on virtual tourism	Assessment Sheet Questionnaire	Students (Limited Trial)	Student Response	Descriptive Quantitative	Quantitative Statistics in the form of Percentages
	Assessment Sheet Questionnaire	Students (Small Group Trial)	Student Response	Descriptive Quantitative	Quantitative Statistics in the form of Percentages

4. RESULTS AND DISCUSSION

4.1 Designing Products in the Form of Interactive Multimedia Based on Virtual Tourism

The development of Multimedia in Geography learning aimed to attract students' attention and motivate them to learn (Lestari et al. 2018). On the other hand, Prismanata & Ismaniati (2017) emphasized that it could invite learners to participate in gaining or improving knowledge independently. The following is an explanation of the results of each stage.

1) Research and Information Collection Stage

Researchers conducted a preliminary study to find potentials and problems in Tourism Geography learning activities. The potential was that there were basic competencies that could make students master tourism spatially and procedurally. Meanwhile, the problem was that no student-centered learning media supported learning activities to achieve these competencies, especially interactive multimedia. The problem explained earlier was one of the reasons researchers developed interactive multimedia based on virtual tourism to overcome learning problems in the Tourism Geography course.

2) Planning Stage

At this stage, researchers created a flowchart to determine the development flow that would be created. By creating flowcharts, researchers could efficiently develop interactive multimedia using predetermined software.

3) Developing Preliminary Form of Product

This product development stage was generally divided into three, namely a) Analysis Stage, b) Design Stage, and c) Development Stage. More details of the three stages can be seen in Table 3.

Table 3. Stages of Developing Preliminary Form of Product

No	Stages	Description
1	Analysis	Performance analysis: Adjustment of Materials into Interactive Learning Media. Needs analysis by conducting *CPMK* and *Sub-CPMK* Reviews (Tourist attractions and tourism potential).
2	Design	Creating products using the Articulate Storyline software with the analysis and preparation of media manuscripts consisting of indicators, materials, sub-materials, and media types. Creating a flow chart.
3	Development	Pre-Production Production Post-Production

Based on Table 3, the stage of Developing Preliminary Form of Product consisted of an introduction section in the form of opening and log-in pages, the content section of a home page containing four main menus, and the closing section in the form of key information. For more details, the virtual tourism-based interactive multimedia design for the Tourism Geography course is presented in Figure 2.

Figure 2. Virtual Tour of Tourist Attraction Locations

4) Preliminary Field Testing Stage

In this stage, initial field trials of product design in terms of the product's substance, construction, and readability were conducted.

5) Main Product Revision Stage

This stage was conducted based on data validation and suggestions from expert validators, practitioners, and users. There were recommendations from experts in virtual tourism-based interactive multimedia materials: (1) There were two sustainable tourism sub-menus on the material menu. Hence, the experts suggested combining the two; (2) Virtual tourism materials should be separated into one specific menu.

6) Main Field Testing Stage

At this stage, the media was tested in small groups or limited trials involving six students in each class A and class B in the Tourism Geography course.

7) Operational Product Revision Stage

At this stage, revisions of the results of more comprehensive trials were carried out to improve the product being tested so that it could be considered as one of the teaching media in the Tourism Geography course. This process considered the characteristics of multimedia learning conveyed by Daryanto (2013), including (i) Having more than one convergent media, for example, combining audio and visual elements; (ii) Being interactive for users; (iii) Being self-contained or easy to use. The development of multimedia projects could help learners achieve more extensive learning goals (Agnew et al. 1996) because they could benefit from a combination of text, graphics, images, audio, video, and animation.

4.2 Theoretical Feasibility Test of Experts in the Development of Virtual Tourism-Based Interactive Multimedia

The assessment of interactive multimedia development based on virtual tourism considered three aspects: material, learning, and media (programming and display). Good multimedia must be reviewed by material experts, media experts, and expert practitioners (Pratama et al. 2021). Wibawanto (2017), explains that educational innovation is "a new change qualitatively different from the previous and deliberately sought to improve abilities to achieve certain goals, including education".

4.2.1 Validation Results of Material Experts

The development of learning multimedia should describe materials following the existing design or context (Bilfaqih & Qomarudin, 2015). Based on the results of material expert validation, the material suitability aspect had an excellent score of 86.67%, and the learning aspect had a good score of 70%. These results indicated that the material expert assessment for the feasibility of multimedia virtual tours was considered feasible with revisions. If converted into a feasibility table, those scores were equivalent to 78.33%, categorized as valid (Arikunto, 2019). The validation results of the material expert are presented in Table 4.

Table 4. Validation Results of Material Experts

Aspects	Material Expert's Score	Maximum Score	Percentage (%)	Description
Material Suitability	26	30	86.67	Highly Valid
Learning Suitability	21	30	70	Valid
Average			78.33	Valid

4.2.2 Validation Results of Media Experts

The multimedia assessment also engaged media experts, examining two main aspects representing the display to make it attractive and practical (Chang et al. 2015). These aspects were programming and display. Media test results/responses are shown in Table 5.

Table 5. Validation Results of Media Experts

Aspects	Material Expert's Score	Maximum Score	Percentage (%)	Description
Programming	27	30	90	Highly Valid
Display	61	70	87.14	Highly Valid
Average			88.57	Highly Valid

Based on the results of media expert validation, the aspects of programming and display obtained excellent scores of 90% and 87.14%. Therefore, the media was considered highly feasible without revision. If converted to the feasibility table, the scores were equal to 88.57%, regarded as highly valid (Arikunto, 2019).

4.2.3 Validation Results of Expert Practitioners

The validation results of expert practitioners revealed that all aspects (language, materials, and learning) obtained an excellent score with a percentage of > 80% in each aspect. It indicated that the media was highly feasible without revision. If converted to the feasibility table, the scores were worth 92.86%, categorized as highly valid (Arikunto, 2019). More details are provided in Table 6.

Table 6. Validation Results of Practitioners

Aspects	Expert Practitioners' Score	Maximum Score	Percentage (%)	Description
Language	10	10	100	Highly Valid
Media	32	35	91.42	Highly Valid
Material	8	10	80	Highly Valid
Learning	25	25	100	Highly Valid
Average			92.86	Highly Valid

4.3 Empirical Feasibility Test of Virtual Tourism-Based Interactive Multimedia

The interactive multimedia assessment process by users (students) was divided into two tests. The first trial was conducted to determine users' responses, while the second was performed to define the same by involving a larger number of respondents. Meanwhile, the limited trial or preliminary field test was carried out on six interactive multimedia users, namely students of the class of 2019 taking part in the Tourism Geography course. Limited trial results are presented in Table 7.

Table 7. Limited Trial Results

Aspects	User	Maximum Score	Percentage (%)	Description
Media	101	120	84.17	Highly Valid
Material	51	60	85	Highly Valid
Learning	227	270	84.07	Highly Valid
Average			84.41	Highly Valid

The trial results demonstrated that aspects of media, material, and learning had an excellent percentage of > 84%. Thus, the feasibility percentage of the initial field trial as a whole was 84.41%. Meanwhile, a small group trial was conducted on six students from class A and six from class B of Tourism Geography. The results of the limited trial are displayed in Table 8.

Table 8. Small Group Trial Results

Aspects	User	Maximum Score	Percentage (%)	Description
Media	209	240	87.08	Highly Valid
Material	109	120	90.83	Highly Valid
Learning	478	540	88.51	Highly Valid
Average			88.81	Highly Valid

The assessment results on media, material, and learning were > 80%. Thus, all aspects were declared highly valid. Vaughan (2004) explains that multimedia combinations consisting of text, graphic art, sound, animation, and video are accessed by users

through computer hardware. The obtained scores were classified as highly feasible in a feasibility table, with an average percentage of 88.81%.

5. CONCLUSION

The development of learning media must be carried out by educators to improve the quality of learning, especially in the 21st century. In this regard, students must be sensitive to the advancement of Information and Communication Technology (ICT). Thus, the development of multimedia learning should describe materials following the learning design. Developing interactive multimedia based on virtual tourism in the Tourism Geography course was expected to improve the quality of Geography learning. Consequently, research innovations were needed in data and projects to produce data elaboration. In this context, the present study revealed that 1) The design of interactive multimedia based on virtual tourism in the Tourism Geography course consisted of 7 pages, including login, introduction, main menu, module instructions, materials, and info; 2) Virtual tourism-based interactive multimedia was considered highly feasible to be developed according to media experts and practitioners and regarded worthy of development by material experts; 3) Virtual tourism-based interactive multimedia, according to students, was highly feasible to be used in learning activities.

Declaration by Authors

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