

Development of Learning Media for Volleyball Subject Refereeing Subjects Based on Satellite E-Learning

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Abstract

This research is a research on the development of learning media for the subject matter of the Volleyball subject matter based on e-learning satellite. This study discusses the role of learning media with technology. This study uses research from Borg and Gall through 10 stages including: (1) Preliminary Study, (2) Research planning, (3) Initial product development, (4) Initial (limited) field trials, (5) Revision of limited field test results, (6) wider field trials, (7) Revision of field test results, (8) Feasibility test, (9) Revision of feasibility test results, (10) Dissemination and socialization of final products. Results of this study: Small group test was carried out by testing display of refereeing material Based on the value of the assessment questionnaire display of refereeing material With indicators of learning implementation assessment and material display, it is concluded that the questionnaire given to small groups has an effectiveness of implementing e-learning based refereeing learning by 55%. In other words, there is still much that needs to be improved so that the application used can have maximum effectiveness in the effectiveness of the assessment questionnaire implementation refereeing learning based on e-learning It can be concluded that the questionnaire given to IT and Media experts has a display pimplementation refereeing learning based on e-learning 56%.

Keywords

learning media; volleyball;

E-learning



I. Introduction

Distance education has been developing since 1883. Along with developments in science and technology, the concept and implementation of distance education has also developed. Until now, distance education can be classified as having passed the fifth generation phase. The first generation of education still used correspondence services (correspondence). Along with the development of radio and television, distance education entered the second generation. Furthermore, with the invention of computers, distance education entered the third. The fourth and fifth generations are difficult to distinguish, because the fourth generation has used a combination of the first, second, and third generations, and the fifth generation has used an artificially based learning environment. This fifth generation is the future form of distance education.

The position of e-learning in distance education is a form of logical consequence, because of the separation of distance and time between learning participants and learning providers, it is absolutely necessary to learn based on information and communication technology (e-learning). Likewise, the independent learning system (independent learning) is

a logical consequence of distance education. So because of the separation of distance and time, distance education absolutely requires the application of independent learning systems and learning systems based on electronic technology (e-learning).

The effectiveness and efficiency of a media is an option in the implementation of the teaching and learning process which should be the goal of the teaching staff. However, in reality, there are still many lessons learned that have not led to what is needed. With the rapid growth of technology, the change from manual will be better by developing technological devices to support the effectiveness and efficiency of time in the learning process. The design that will be carried out in this research is the Development of Learning Media for the Subject of Volleyball Subject Surveillance Based on e-learning Satellite.

II. Review of Literatures

2.1 Development Concept

Research and development (Research and Development) according to Borg & Gall is a process used to develop and validate products. There are many development research models that we can use, but in this discussion, we will briefly review development research using the Borg and Gall (1989) model. Borg and Gall's (1989: 784-785) version of the development research model includes ten activities, namely: (1) Preliminary Study (Research and data collection). (2) Research planning. (3) Initial product development. (4) Initial (limited) field trials, (5) Revision of limited field test results, (6) wider field testing, (7) Revision of field test results, (8) Feasibility test, (9) Revision of feasibility test results, (10) Dissemination and socialization of the final product.

2.2 E-learning Technology and Media Used in Distance Education

There are actually a lot of available technology and media options used in distance education. Holden (2005) mentions several technologies and media, both for synchronous and asynchronous learning, including e-learning satellites. This learning itself is distance learning, namely the delivery of learning and learning materials via internet protocol (IP) as a distribution network. In the Indonesian context, an example of satellite-learning is like that carried out by the directorate of higher education, namely the INHERENT (Indonesia Higher Education Network) program which utilizes the Virtual Private Network (PVN) or SEADUNET facilities carried out by SEAMOLEK.

In distance education, technology and learning media as mentioned above can be used for simultaneous learning from the time side even though the location is not the same (synchronous). There are several learning media used for learning simultaneously both in terms of time and location (asynchronous). Further, Holden (2005) summarizes the following.

Table 1. Variety of Media in Synchronous and Asynchronous Learning

	Synchronous	Asingkronous
Visual		<ul style="list-style-type: none"> • Correspondence (letter) • Printerd media (print module) • Recorded video
Audio Only	Audio Conference	Audio recording
Audio visual	<ul style="list-style-type: none"> • Learning television / satellite e-learning • Video teleconferencing • Synchronous web based learning 	<ul style="list-style-type: none"> • Video recording • Computer based learning • Asynchronous web-based learning • Learning television

2.3 Definition of Media

Before this description reaches the use of media by teachers in the teaching and learning process, it is better to understand what the media actually means. The word "media" comes from Latin and is the plural form of the word "medium", which literally means "intermediary or introduction". Thus, the media is a vehicle for channeling learning information or distributing messages.

According to Sukiman in Prasasti (2019) said that learning media is anything that can be used to channel messages from the sender to the recipient so that it stimulates the thoughts, feelings, attention, and interests and wishes of students in such a way that the learning process occurs in order to achieve the learning objectives effectively. Meanwhile, according to Wiarto (2016: 3), "learning media is a learning tool used to convey information to students that aims to make students know". From this statement, the understanding of instructional media is described based on the objectives

Learning media is divided into 6 (six) types, namely: (1) Text; (2) Audio; (3) Visual; (4) Motion; (5) Real objects and models; and (6) People[1]. The most commonly used learning media is text-shaped media. This type of text media is used to convey learning material in the form of books, posters, whiteboards, computer screens and others. Other types of media that are often used as learning media are audio, including anything that can be heard, for example, human voice conversations, music sounds, mechanical engine sounds, and others. Visual type learning media are such as diagrams in a poster, images posted on walls (eg wall charts), pictures on a blackboard using chalk or markers, graphics in a learning book, photographs of objects, and others. Motion is a learning media in the form of motion such as videotape, film, and animation. Real objects or models are learning media in the form of three dimensions that can be touched and held by students. An example of a model-shaped learning media commonly used in vocational learning is "trainer"[4]. The last type of media is humans, namely teachers, students, or experts in their fields. Students can learn through teachers, fellow students, or to an expert in their fields. (Pratama et al, 2021)

If media is a source of learning, media can be broadly defined as people, objects, or events that allow students to acquire knowledge and skills. In the teaching and learning process, the presence of the media has quite an important meaning. Because in this activity the unclear material presented can be helped by presenting the media as an intermediary.

a. Media as a Tool

Humans can actually learn through six levels (Veron A. Magnesen), namely:

1. 10% of what is read
2. 20% of what is heard
3. 20% of what is seen
4. 20% of what is seen and heard
5. 20% of what is said
6. 20% of what is said and done

b. Kinds of Media

The media which has long been known today is not only of two types, but it is more than that. The classification can be seen from the type, coverage, and from the material and method of manufacture. All of this will be explained in the following discussion.

Judging from its type, the media is divided into:

- a. Auditive Media.
Auditive media is media that can only rely on voice capabilities, such as radios, cassette recorders, LPs ..
- b. Visual Media
Visual media is a medium that only relies on the sense of sight, this visual media displays still images such as film strips (series films).
- c. Audiovisual Media
Audiovisual media are media that have sound and image elements.

2.4 Basic Considerations for Choosing Media Sources

In order for the selected teaching media source to be appropriate, in addition to fulfilling the principles of selection, there are also several factors and criteria to consider as described below.

Factors To Consider In Choosing A Media Source

- a) Objectivity
The element of teacher subjectivity in choosing teaching media must be avoided. This means that teachers should not choose teaching media on the basis of personal pleasure.
- b) Teaching Program
The teaching program must be delivered to students in accordance with the applicable curriculum, both in content, structure, and in depth.
- c) Program Goals
The program target in question is students who will receive teaching information through teaching media at a certain age level and in certain conditions, students have certain abilities, both in their way of thinking, their imagination, their needs, and their learning endurance.
- d) Situation and condition
The existing situations and conditions also need attention in determining the choice of teaching media to be used. Situation and conditions as needed

2.5 Volleyball

According to Yunus (1992: 1) Volleyball is a team or team game for the purpose of entering the ball in the opponent's area through an obstacle in the form of a rope or net and trying to win the game by turning the ball off in the opponent's area. The role of volleyball is no longer just a recreational sport, but has developed into a part of educational sports and achievement sports or competitive sports.

Lenih continued Djoko Pudjihidajat in the journal Prasetyo (2015: 779) explained that volleyball is a team sport (Olympics) where two teams consist of 6 active players, each team is separated by a net. Each team tries to make a point by dropping the ball onto the opponent's court which is organized under the rules. Volleyball is a sport game that has many fans. To be able to play volleyball, mastering basic techniques includes passing, serving, smash and block. Technique is a way of doing or implementing something to achieve certain goals efficiently and effectively in accordance with the applicable game rules to achieve optimal results.

a. First Time Volleyball Game Rules

Apart from being an inventor, of course the rules in this volleyball game were also first made by William G. Morgan. He made a net 1.98 meters high and then put it in the middle of the field. The field size used was 7.6 meters x 15.2 meters. In addition, there is also a

duration in this volleyball game first, where each game or match consists of 9 sessions and with 3 services performed by each team and session.

b. Volleyball Game Rules

The field is divided into two equal playing areas, sometimes called the team area. The volleyball court has a length of 18 meters and a width of 9 meters, and is divided into 2 areas so that each area becomes 9x9 meters. Each area has an attack line that is 3 meters from the middle. . The net for volleyball games has a height of 2.43 meters, while for women it is 2.24 meters.

2.6 Rule of the Game

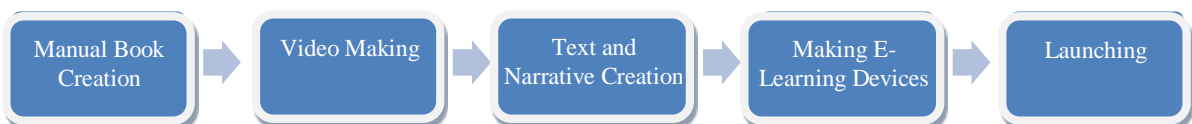
The game starts with the toss of a coin to determine which team has the right to choose which course, or serve or not. After the opponent serves or gets a point, the one who does the serve switches by rotating clockwise. And so on. If there is an error rotation points will be awarded by the opponent.

The team can win the match if the team gets the 3 sets first. Each set consists of 25 points, except for the 5th set which has only 15 points, and before executing the 5th set there is another toss of coins to choose which team can choose which course.

Time Out (TO) in volleyball game 2 on points 8 and 16, and each team has the opportunity to ask the referee 2 times TO in each set. Unless the 5th set occurs, TO is only held once at the 8th point, and each team has a chance of TO remain the same, which is 2 times.

- Each player on the field only 6 players, and each team must not be more than 12 players.
- Players must be in their respective positions, unless after the opponent has performed the service, the player may switch positions, only the back player may not jump in the attack area.
- The team serving or controlling the ball has the right to make 3 touches with different players, and if the team blocks and the block touches the ball, that does not count.
- The player can touch the ball with either body or two body parts simultaneously.
- The ball must not hit the body twice or for too long, because it is a foul.
- Players are not allowed to touch the net and step on the opponent's area. But body parts can loosen up over the opponent's area. Like when blocking, hands can stick out into the opponent's area.

2.7 Draft Android Application that will be developed



2.8 Framework of Thinking

The framework of thinking in this research is in the form of e-learning-based learning media development in a system which is a product in answering the needs of the teaching and learning process at the Faculty of Sports Science which has an impact on efficiency and is effective in using time. This media is expected to be able to help achieve maximum results in the final project bills for advanced volleyball courses. This product will also integrate with today's developments by utilizing the e-learning system which is a support system that will be used in e-learning-based satellite learning.

III. Research Methods

This study uses research from Borg and Gall through 10 stages including: (1) Preliminary Study, (2) Research planning, (3) Initial product development, (4) Initial (limited) field trials, (5) Revision of limited field test results, (6) wider field trials, (7) Revision of field test results, (8) Feasibility test, (9) Revision of due diligence results, (10) Dissemination and socialization of final products

3.1 Place and Time of Research

The place where this research was conducted was at the Faculty of Sport Science, State University of Medan. The time of this research was conducted for one semester, namely in August - November 2020. This research only took the subject matter in the advanced volleyball subject.

3.2 Data Collection Techniques and Data Analysis Techniques

The research instrument used was an expert observation test, interviews, documentation and observation sheets. There are several data analysis techniques used, including descriptive analysis and inferential analysis. Data analysis in this development research used t test analysis technique.

3.3 Research Instruments

1. The instrument of this research was to use interviews about e-learning based instructional tutorial guides to volleyball refereeing experts
2. Using interviews in seeing the appearance of refereeing media to media experts about the display content of e-learning-based mediation material
3. Using interviews, which is what it is like to look for data through statements to students, what is the effectiveness of the e-learning-based refereeing video media can help in advanced volleyball course assignments.

IV. Result and Discussion

4.1 Effectiveness of Android-Based Data Processing Application Development

The first stage of testing was carried out on 5 teaching teams. This section is tested on applications that have been made.

a. Assessment Questionnaire

1. Assessment Questionnaire refereeing learning based on e-learning

Assessment questionnaire refereeing learning based on e-learning has 12 statement items. The results of the questionnaire assessment conducted by the volleyball teaching team can be seen as follows:

Small group test is done by testing display of refereeing material by using two indicators. Based on the value of the assessment questionnaire Inspection Material Appearance with indicators of learning implementation assessment and material display with a questionnaire value of 32 with an ideal score of 61 with an effectiveness percentage of 51%. As for the material display, the questionnaire value was 115 with an ideal score of 200, the effectiveness was 58%. For the overall indicator, the questionnaire score was 143 with an ideal score of 261 and the percentage was 55%. So it is concluded that the questionnaire given to small groups has an effectiveness of implementing e-learning based refereeing

learning by 55%. In other words, there are still many things that need to be improved so that the applications used can have maximum effectiveness.

2. Processing Application Display refereeing learning based on e-learning The first stage of testing was carried out on 3 IT and Media experts. This section is tested on the web that has been created.

b. Assessment Questionnaire

Processing Application Assessment Questionnaire refereeing learning based on e-learning. Assessment questionnaire data processing development refereeing learning based on e-learning has 12 statement items. The results of the questionnaire assessment conducted by IT and Media experts can be seen as follows: In the effectiveness of the assessment questionnaire implementation refereeing learning based on e-learning It can be seen that the assessment indicator of the test implementation and data processing of the questionnaire value is 17 with an ideal score of 38 and the percentage of its effectiveness is 53%. As for the physical measurement assessment indicators, the questionnaire value was 69 with an ideal score of 117 with a percentage of 57%. For the overall assessment indicators, the questionnaire value obtained a value of 88 with an ideal score of 156 with a percentage of 55%. So it can be concluded that the questionnaire given to IT and Media experts has a display implementation refereeing learning based on e-learning 56%. In other words, there are still many things that need to be improved so that the application used can have maximum appearance / effectiveness.

Development Effectiveness Implementation refereeing learning based on e-learning. The second stage of testing was carried out on 10 people. This section was tested on refereeing learning based on e-learning which has been revised based on the results of a questionnaire given to small groups. For large samples. For the effectiveness of the assessment questionnaire Implementation refereeing learning based on e-learning, the indicator for the assessment of the implementation of data learning has a questionnaire value of 117 with an ideal score of 122 and obtaining an effectiveness percentage of 96%. As for the indicator of the display of refereeing material, the questionnaire value was 389 with an ideal score of 402 and the effectiveness percentage was 97%. For all indicators, the questionnaire value was 501 with an ideal score of 522 with an effectiveness percentage of 97%. In other words, the e-learning-based refereeing learning used is feasible to be used and marketed to the public.

4.2 Display of Reviewing Materials

The second stage of testing was carried out on 3 IT and Media experts. In this section, a test was carried out on the refereeing appearance that was revised in the first stage.

a. Assessment Questionnaire

1. Questionnaire for Assessment of Android-Based Data Processing Applications

Assessment questionnaire development of android based volleyball athlete based sports talent scouting test data processing development has 12 statement items. The results of the questionnaire assessment conducted by IT and Media experts can be seen as follows: For the effectiveness of the assessment questionnaire refereeing learning based on e-learning It can be seen that the questionnaire given to IT and Media experts for the assessment indicators of test implementation and data processing of the questionnaire value is 35 with an ideal score of 36 and the percentage of effectiveness is 57%. For indicators of measuring the implementation of learning, the questionnaire value is 116 with an ideal score of 120 with a percentage of 57%. For all indicators, the questionnaire score was 151 with an

ideal score of 156 with a percentage of 57%. In other words, the display of the material used is appropriate for use and marketed to the public. However, there are still a few more improvements that must be made before they are disseminated to the public.

2. The effectiveness of the first stage of Android-based Data Processing Application Development

Assessment of Supervision Material Display with learning implementation assessment indicators and material display with questionnaire values given to small groups has an effectiveness of implementing e-learning based refereeing learning by 55%. In other words, there are still many things that need to be improved so that the applications used can have maximum effectiveness. While the questionnaire given to IT and Media experts has a display of the implementation of e-learning based refereeing learning by 56%. In other words, there are still many things that need to be improved so that the application used can have maximum appearance / effectiveness.

3. The effectiveness of the second stage of Android-Based Data Processing Application Development

This section conducted trials on revised e-learning based refereeing learning based on the results of a questionnaire given to small groups for large samples. For all indicators, the questionnaire value was 501 with an ideal score of 522 with an effectiveness percentage of 97%. The overall indicator score for the assessment questionnaire was 151 with an ideal score of 156 with a percentage of 57%. In other words, the display of the material used is appropriate for use and marketed to the public. However, there are still a few more improvements that must be made before they are disseminated to the public.

V. Conclusion

Based on the results of field trials and the results of the researcher's discussion, it can be concluded that: Based on testing with small groups and large groups in providing basic satellite e-learning volleyball refereeing material, PJKR students can conclude that: Learning volleyball refereeing material based on satellite e-learning is better than conventional methods that have been applied in volleyball learning in refereeing material.

Suggestions

Based on the result research that has been state that "Development of Web-Based Basic Volleyball Learning Media for E-Learning Satellite-based Surveillance Materials. " already feasible and validated by sports experts, media experts and volleyball experts, then there are some suggestions as follows.

1. In the student learning process, lecturers can take advantage of "Development of Learning Media for Volleyball Learning Materials Based on Satellite E - Learning Physics, State University of Medan".
2. Students can take advantage of Satellite E - Learning for learning and practicing as much as possible.
3. Can conduct evaluations for lecturers of student activity in learning.
4. Provide space and time for students to study all volleyball refereeing material available on the web.

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