Design Avionic Learning Media - VHF-HF Communication Based on Multimedia Animation on the ATKP

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ABSTRACT

The importance of learning media and the development of technology is well-used Medan ATKP to continue to improve the quality of learning. The problem often encountered in avionic learning is the limited resource available because to access avionic learning the cadets must access from the LBT CBT and cannot be from elsewhere. This is because Avionic software is only installed in the lab and cannot be learned from outside the lab. The purpose of this study is to improve the digital avionic-VHF-HF Communication learning process that is packaged in multimedia animation to make it easier for cadets to learn avionic VHF-HF Communication without having access to a laboratory. The method used in this research is to use the Multimedia Development Life Cycle method, namely the Concept, Design, Material Collecting, Assembly, Testing, and Distribution. The resulting output is an animated video production and publication to journal.

I. Introduction

Learning media constitutes something that can deliver message, stimulate thought, feeling and will encourage the learning process [1]. Multimedia refers to any computer-mediated software or interactive application that integrates text, color, graphical images, animation, audio sound, and full motion video in a single application [2]. Movement visual, sound media (movement visual, sound media) will be media that have sound, there is development and the state of the article can see. The information presented in the form of a living document can view on the monitor screen or when projected on the big screen through a projector can hear and can see in its movements (video or animation). In interactive media learning, dynamic preparing requires five cognitive forms: selecting words, selecting pictures, organizing words, organizing pictures, and coordination [3] [4]. Directions video, media may be a medium that presents sound and visuals that contain learning messages that contain concepts, principles, rules, speculations of application of information to assist get it a learning fabric. Learning media based on moving pictures (animation/video) can encourage students' understanding when used in a way that is consistent with multimedia learning theory.

Learning media can be comprehended as whatever can pass on or channel messages from a source in an arranged way so a favorable learning condition happens where the beneficiary can...
complete educating and learning forms productively and successfully. So that learning material is more quickly accepted by students as a whole and attracts students' interest to study further [5]. 

Niken and Haryanto (2010: 11) suggested that multimedia is a combination of various media (file formats) in the form of text, images (vector or bitmap), graphics, sound, animation, video, interactive, and others that have been packaged into digital files (computerized), used to convey messages to the public.[6] Niken and Haryanto say that the benefits of multimedia, namely: (1) The introduction of information and communication technology to students, (2) Providing new and enjoyable experiences for both the lecturers themselves and students, (3) Pursuing underdevelopment of knowledge about science and technology in the field education, (4) Utilization of multimedia can arouse learning motivation of learners, (5) Multimedia can be used to help learners form mental models that will make it easier to understand a concept, (6) Follow the development of science and technology [7]. Improve services offered to internal and external customers [8], increased productivity [9] of cadets.

Problems in general so far Avionics learning is done in laboratory CBT - Computer Based Training - Academy and Safety Flight Medan (ATKP Medan) with a desktop application already installed therein which is directly connected to a server in New York. This is quite difficult for cadets in the learning process, quite difficult in repeating learning because the only access is access to the CBT LAB, especially for VHF-HF Communication material. For that, we need a learning media in the form of design based on animated multimedia.

Radio communication systems for aircrafts are primarily for the purpose of air traffic control. The communication takes place normally on HF and VHF frequencies. The communication radios are not only used for voice transmission, but they may also be used as data links. HF communication systems are long distance communication systems providing extended ranges, whereas VHF systems are employed for short-range communication normally limited to line of sight distances.

II. The Proposed Method

A. High frequency (HF)

High frequency (HF) is the ITU (The International Telecommunication Union) designation for the range of radio frequency electromagnetic waves (radio waves) between 3 and 30 megahertz (MHz) [10]/. It is also known as the decameter band or decameter wave as its wavelengths range from one to ten decameters (ten to one hundred metres). Frequencies immediately below HF are denoted medium frequency (MF), while the next band of higher frequencies is known as the very high frequency (VHF) band [11].

B. Very high frequency (VHF)

Very high frequency (VHF) is the ITU designation for the range of radio frequency electromagnetic waves (radio waves) from 30 to 300 megahertz (MHz), with corresponding wavelengths of ten meters to one meter. Frequencies immediately below VHF are denoted high frequency (HF), and the next higher frequencies are known as ultra high frequency (UHF) [12] [13].

C. Components of HF Communication System

HF equipment on an aircraft usually comprises the following parts [14]:

- The Transceiver (Transmitter and Receiver) Unit
- The Antenna Unit, and Antenna Tuning Unit
- The Antenna Coupler
- The Control Panel

III. Method

Research that researchers make use of research methods of study of literature and observation are as follow:

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1. Observation
The researcher made direct observations about VHF-HF Communication avionics learning at the LAB.

2. Literature Study.
The researcher looks for reading literature as well as sources of reference that support and relate to topics taken by researchers to get an accurate theoretical foundation.

Advancement of Avionics Learning Media digitization for Implementation right now the technique for Multimedia Development Life Cycle (MDLC) which comprises of six stages [15]. The stages in MDLC that arranged systematically are as follows:

1. Concept
The idea arrange is the main stage in the MDLC cycle. At the idea arrange, it begins by deciding the motivation behind making the digitization of Avionics learning media and determining the users of multimedia animation. In this research, the purpose of making multimedia animation is to help cadets in learning Avionics.

2. Design
A develop idea will make it simpler to depict what necessities doing. The motivation behind the plan arrange is to make itemized details of the venture engineering, the appearance and material prerequisites of the task, and style. This stage uses a storyboard to illustrate a series of stories or descriptions of each scene so that it is understood by the user by including all multimedia objects and links to other scenes.

3. Material Collecting
Material Collecting is the phase of gathering materials that suit your requirements. These materials incorporate pictures, photographs, movements, recordings, sound, and content either instant or which despite everything need to change as per existing necessities. These materials can be acquired for nothing out of pocket or by requesting different gatherings as per the plans that make in the prior stage.

4. Assembly
The gathering stage is the phase of making the sight and sound material. Applications will be made dependent on the plan arrange, for example, storyboards.

5. Testing
Testing is done to make sure that the results of the creation of multimedia activity in understanding with the arrange. There are two sorts of testing utilized, specifically alpha testing and beta testing. Alpha testing such as displaying each page, button functions and the sound produced. If there is a malfunction, the application will be fixed immediately. If it has passed the alpha test, it will be continued with beta testing. Beta testing is a test conducted by the user, by making a questionnaire about the application made.

6. Distribution
This organize is the final organize within the interactive media improvement cycle. Dispersion is done after the application pronounced to reasonableness for utilize. At this arrange, the application will be put away in a capacity medium such as a CD, hard drive, server, versatile gadget or site. If there are not enough storage media to accommodate the multimedia animation, compression of the multimedia animation will be carried out. The evaluation phase is included in this stage. An evaluation is needed for the development of multimedia animations that have been made before to be better.

IV. Results and Discussion

A. Result

1. Concept
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On Avionics learning VHF-HF Communication MEDIA DESIGN, there are four sub videos;

- Introduction,
- HF Communication Systems,
- VHF Communication Systems,
- Emergency Locator Transmitters.

Where each video will explain in detail the important points in VHF-HF Communication in minute duration by displaying MULTIMEDIA ANIMATION containing text and sound in the explanation.

2. Design
   a. Page Introduction

![Figure 1. Introduction Page Display](image1)

b. HF Communication Systems Page

![Figure 2. HF Communication System Page Display](image2)

c. VHF Communication Systems Page

![Figure 3. VHF Communication System Page Display](image3)
d. Transceiver Unit – Receiver – Transmitter – Transceiver

Figure 4. Transceiver Unit – Receiver

Figure 5. Transceiver Unit - Transmitter

Figure 6. Transceiver Unit – Transceiver

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e. VHF Antenna Configuration

Figure 7. VHF Antenna Configuration

f. Emergency Locator Transmitters Page

Figure 8. Emergency Locator Transmitters Page Display

3. Material Collection

Material is an important material in the making of Avionics Learning Media Design-VHF-HF Communication. Materials can be made by yourself, buy or use the free materials
contained on certain websites. Animated asset material created with desktop applications and sound from text to speech Balabolka is obtained by using assets that can use free of charge.

4. Assembly

The Avionics-VHF-HF Communication Learning Media Building Design, has been created in Photoshop and an adobe premiere application for sound using Text to Speech and Balabolka arranged according to a specific timeline to display Multimedia Animation.

5. Testing

The following is an explanation of the results of the Avionics-VHF-HF Communication Development Plan which can make:

- Avionics-VHF-HF Communication Learning Media in the form of a landscape which be adjusted to YouTube resolution so that it is not too heavy if it runs later on android.
- After we press play, the video will display Avionics-VHF-HF Communication Learning Media.

From the results of tests that were done, it will be seen that the Avionics-VHF-HF Communication Learning Media that can make can run well.

Figure 9. This completes VHF-HF Communication

6. Distribution

Video Avionics-VHF-HF Communication as a form of digitization of Learning Media can be completed and used in the Medan ATKP internal environment, and publication to journal.

V. Conclusion

To produce a design Avionics learning media-VHF-HF Communication requires four types of display, namely the introduction page, HF Communication System page, VHF Communication System page, Emergency Locator Transmitters. The learning media produced are of several minutes duration, which uses for cadets as learning materials for VHF-HF Communication. The advice is given next is to add case studies or practice questions into the learning content.

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