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DESIGN OF INSTRUCTIONAL MEDIA BASED AUDIO VISUAL ON AERODROME CONTROL PROCEDURE FOR AIR TRAFFIC CONTROL COURSE

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Abstract

This research aims to design an instructional media on the subject of Aerodrome Control Procedures Laboratory I based audio visual on Air Traffic Control Course, Medan Civil Aviation Academy. Audio-visual media-based learning is designed using software ArchiCAD, SketchUp, camtasia and programs of Microsoft Office Power Point application that relies on the concept of stunning audio-visual. This instructional media combines the procedure contained in the Air Traffic Control Handbook Laboratory Seahorse-Batfish Air Traffic Control Procedures (Non-Radar) with Doc. 4444 Air Traffic Management Chapter 12 Phraseology is completed with an overview of the theoretical scenarios delivered through motion animation.

Keywords: *Instructional media, audio visual, method, Aerodrome Control Procedures, Air Traffic Control*

1. INTRODUCTION

Based on observation conducted on cadets of Air Traffic Control Program on the subject of Aerodrome Control Procedures Lab. I (practice), the average understanding of the theories of cadets of Aerodrome Control Procedures obtained from the lecturer or instructor is still not optimal. The lack of mastery of the theory would affect the simulation in the laboratory. There are several factors that may affect the achievement of learning outcomes of the cadets. According H Djaali, (2007), factors affecting a person's achievements or learning outcomes are internal factor and external factor (environment). The internal factors include health, intelligence, interest and motivation, and learning, while external factors consists of family, school, society and environment.

One of the external factors that could affect the school environment including the delivery of teaching (teaching methods). The method is applied to the cadets in the learning process that is much more conventional use of lectures and little use of teaching aids in the form of audio or visual. While subjects Aerodrome Control Procedures Lab I, which is subject require visualization practice in the delivery of the materials, for example start up, pushback to take off for the departure flight (departing) and landing flight instruction on arrival (to come). It is intended that the cadets have the same perception or understanding without having any imagination of their own. The process of learning should be more valuable so it needs a whole package of learning that gives education and motivation to cadets.

So this research will discuss the design of instructional media based audio-visual that can help the cadets to improve understanding of the theory of Aerodrome Control Procedures on Air Traffic Control Program at Medan Civil Aviation Academy

2. LITERATURE REVIEW

2.1. Instructional Media

Media comes from the word "medius" which means middle, intermediary or introduction. Media is a tool that has the function of conveying the message (Boove, 1997). Meanwhile, according to Anton Noornia Marshal McLuhan (McLuhan, 2006), the media is an extension of man that enables it affects others who do not hold a direct contact with him. In Arabic, the media is wasail or wasilah which means an intermediary or an introductory message from the sender to the receiver (Arsyad, 2006).

Instructional media is a tool or form of stimulus that serves to convey a message of learning. Instructional media includes not only complex electronic communication media, but also simple forms, such as slides, photographs, diagrams, real objects and visits outside the classroom (study visit). Good instructional media is expected to provide benefits such as: (1) the material is presented more clearly to give meaning for learners and non verbalistic; (2) make the learning is more varied; (3) students to become more active in a variety of activities; and (4) the learning is more interesting. Moreover, a good media also should stimulate learners to remember what they have learned, to enable learners to provide feedback,

2.2. Type of Instructional Media

Classification of the media in general can be seen by its ability to evoke sensory stimulation. Judging from the stimulation of the senses, there are three types of media that can be used in learning, namely:

1) Visual media, the media or instructional aids that can only be seen by using the sense of sight. These media types such as images, text and objects. Visual media is divided into two, namely: (a) the visual media that can be projected, the media were very simple, does not require projectors, e.g. pictures, illustrations, caricatures, posters, charts, diagrams, graphs, maps, clippings, magazine wall, nature or models; (B) visual media cannot be projected, the media delivered through the projector that can be reflected on the screen and usually in use cannot be separated from the two elements of the software (software) and hardware (hardware), such as OHP, transparent slide, silent film, film strips and projectors.
2) Audio media, i.e. media or instructional aids that contain messages in auditory form or relating to the sense of hearing that can stimulate the mind, feelings, concerns, and the willingness of students to study the materials. The example of this audio media are sound tapes, radio programs and laboratory language.
3) Audio-visual media is the media or instructional aids that have pictures and sound simultaneously. For example a film, video, television, laser discs, compact disc videos, and multimedia computer.

3. ANALYSIS OF PROBLEM

The learning method applied to the Aerodrome Control Procedures Lab I is still having conventional teaching methods (faculty teaching). If it is categorized into types of learning patterns that explain the link between the media in learning, then learning patterns that have been used in traditional learning adopt patterns 1 and 2.

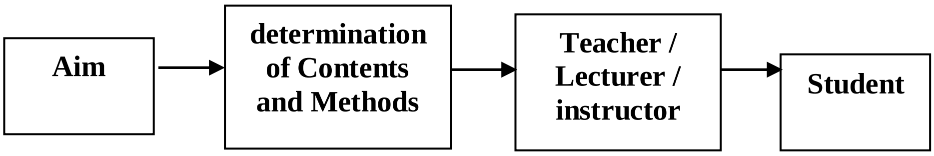

Figure 1. Diagram of Traditional Teaching Pattern 1

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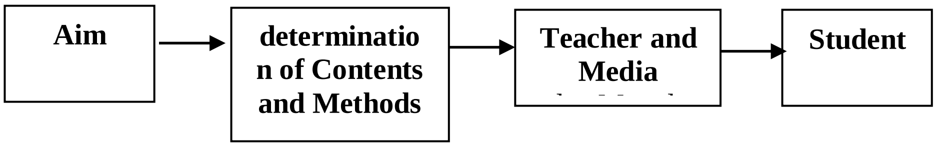
In traditional learning pattern 1, the role of the lecturer or instructor is the only source of learning in the learning activities. Cadets only obtain information from the lecturer or instructor as a messenger or the subject matter.



Figures 2. Diagram of Traditional Learning Pattern 2

In the traditional learning pattern 2, the lecturer or instructor delivers learning material with the help of visual media in the form of picture or describing it on a whiteboard or blackboard. Both types of learning will certainly be felt very boring, especially for cadets who have the type of visual learning (visual learner) because cadets with this type of learning will only have high interest when the learning process is assisted by the presence of visual illustrations.

The lack of instructional media used in Aerodrome Control Procedures Lab I can cause learning to be less clear and difficult to understand. Moreover, learning will also be less interesting and less varied because cadets are more likely to listen to the narrative of words by the lecturer or instructor. In the end, cadets lack of the theory to be used when conducting air traffic simulations at the ADC Laboratory. This is supported by the results of number of questions on the questionnaire given to cadets of the Air Traffic Control Study Program, of which 60% of cadets said it was unclear about the material provided in Aerodrome Control Procedures Lab I; 53% of cadets said that current learning was monotonous and even 77% tended to be boring. This makes it difficult for 57% of cadets to understand the material because it is difficult to imagine. With the learning patterns applied to the Aerodrome Control Procedures Lab I, the teaching and learning process will also always depend on the presence of lecturers or instructors. While as cadets who are still new to the field of air traffic control, they have to do a lot of independent learning and simulation exercises outside the compulsory hours of study.

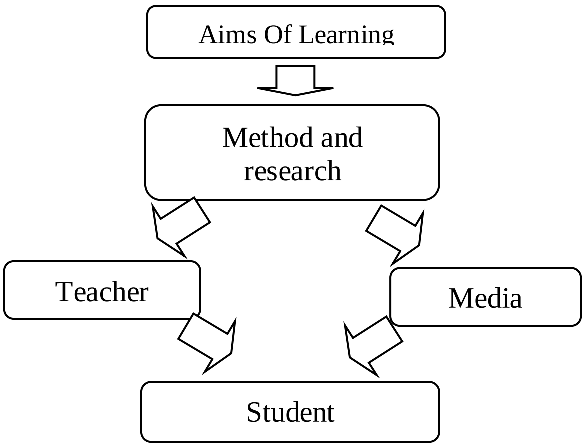
4. ANALYZED PROBLEM SOLVING

There are some problem solving that could be offered, namely:

a. To improve the learning method of Aerodrome Control Procedures Lab I.

The development of information technology that is increasing rapidly in the current era of globalization is inevitable and it gives influences to the world of education. Globalization makes the world of education always adjust technological developments to improve the quality of education, especially adjusting the use of information and communication technology to the world of education, especially in the learning process. Therefore, related to the Aerodrome Control Procedures Lab I learning method, there needs to be a change in learning pattern, from traditional learning pattern to instructional media patterns.

The purpose of this learning pattern is to be able to help cadets in understanding and mastering each subject matter well. This is because the presence of instructional media as a tool used by teachers to clarify information / messages of learning, put pressure on important parts, give variations in learning and clarify the structure of learning. Even if further development of this learning pattern is carried out, in the future the media will act as the main source of information in learning activities or commonly called the learning pattern of media where the role of the lecturer or instructor is only as a learning facilitator.



Figures 3. Design of Teacher and Media Learning Patterns

By conducting teacher and media learning patterns, lecturers / instructors are required to use various media formats to achieve their learning goals. The format can be in form of visual media, audio media, print media, audio-visual media, and so on. With the support of a variety of instructional media formats, cadets will feel more interested in learning the material of the subject.

Moreover, giving briefings by lecturers or instructors to cadets before the simulation of exercise at the ADC Laboratory is important, because the briefing is aimed to make all cadets getting the same perceptions, attitudes and productive actions towards achieving a goal. The briefing should be followed by giving real case examples so that the understanding of cadets will be faster about the procedures of controlling traffic in the airport.

b. Designing Instructional Media Based-Audio Visual

The design of instructional media based-audio visual is based on the problems faced by the Air Traffic Control Study Program, especially on the subject of the Aerodrome Control Procedures in improving cadets' learning achievement. This instructional media based-audio visual is designed to use archicad, sketchup, camtasia and Microsoft Office Power Point application programs that rely on interesting audio-visual concepts.

This instructional media combines procedures contained in the handbook Air Traffic Control Laboratory of the Seahorse-Batfish Air Traffic Control Procedures (Non-Radar) with Doc. 4444 Air Traffic Management Chapter 12 Phraseology to support the scenario theory through animaton.

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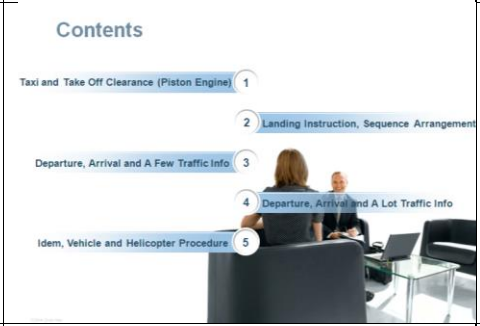
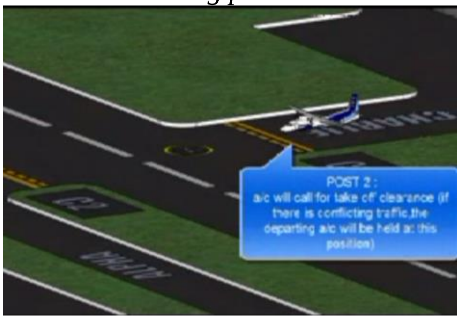
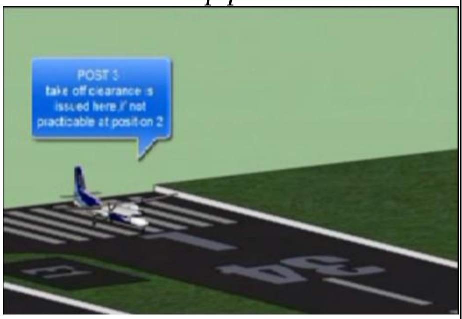
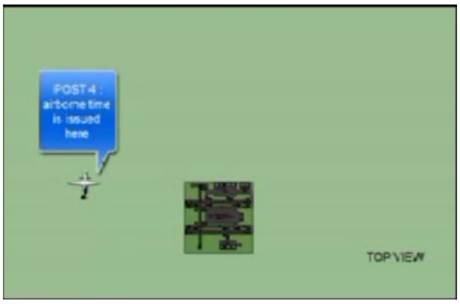
Table 1. Indicator of Competition

No	Competency	Standard Competition	Indicator
1	*Taxi and take off* (*piston engine*)	Cadets can provide taxi and take-off clearance at least 80% correct	After watching the video cadets are expected to be able to: 1. Provide taxi clearance 2. Provide efficient taxi routes 3. Give take-off clearance 4. Gives separation between departure aircraft 5. Fill in the marking strip for the VFR departure plane

Tables 2. Description of System

NO	DESCRIPTION	VISUAL	AUDIO
1	Teacher takes one topic of exercises by clicking it e.g. *Taxi and Take Off* (*Piston Engine*)		Sound Effect
2	Teacher explains *taxi clearance*	Aircraft on the *apron* 	Communication of Pilot & ATC: P: SHE TWR this is PK ABP A: PK ABP, SHE TWR go ahead P: PK ABP position West Apron req. taxi clearance bound for Sunfish alt. 7000 ft A: PK ABP rwy 34L wind 300 degrees/13 kts QNH 1011 time 02.02 taxi to holding point C1 via taxiway C hold

			short of rwy 34L P: [Readback] PK ABP
3	Teacher explains: - aircraft cannot stop through *marking hoding point taxiway* - requirements for aircraft entering *runway in use*	Aircraft at *holding position* 	Communication of Pilot & ATC: P: PK ABP short of rwy 34L A: PK ABP line up rwy 34L report ready for departure P: [Readback] PK ABP
4	Teacher explains: - *take off clearance* - *separation* between *departure* and *departure;* and *departure* and *arrival*	Aircraft on *line up position* 	Communication of Pilot & ATC: P: PK ABP ready for departure A: PK ABP rwy 34L cleared for take off P: [Readback] PK ABP
5	Teacher explains the procedures of *transfer of control* from TWR unit to APP unit	Aircraft on *airborne position* 	Communication of Pilot & ATC: A: PK ABP airborne 02.06 report over point Bravo P: PK ABP airborne 02.06 climbing to 7000 ft estimate Bravo 12, TF 18, Coral 22 report over point Bravo PK ABP A: SHE TWR
6	Teacher explains *Flight Progress Strip* (*Strip Marking*) for *departure aircraft*	Fill in *Flight Progress Strip* (*Strip Marking*) for *departure aircraft* 	Phraseology of Pilot-ATC

With this video, it is hoped that it can help cadets in having the same basic and clear understanding. The results of the study according to Raharjo (1991) show that teaching and learning activities will be more effective and easier if assisted by visual aids, where 11% through audio, while 83% through visual.

4. CONCLUSION

Based on the results of research and discussion it can be concluded that:

a. The average understanding of cadets of Air Traffic Control Study Program on Aerodrome Control Procedures Lab I with current methods is at the level of "sufficient" and even "less".

b. There are some problems in the implementation of Aerodrome Control Procedures Lab. at Medan Civil Aviation Academy:

   1) Aerodrome Control Procedures mostly taught by conventional method using instructional books and white boards.

   2) Learning process that is currently conducted is less attractive and less varied so tend to feel bored quickly.

   3) Learning process that is delivered through audio without any visualization makes cadets feel difficult to understand the material given.

c. From the result of a survey conducted by cadets, it is expected to change conventional method with instructional media method.

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