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Development of 3D Animated Video First Responder Life Support (Choking) for Baby Safety

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Abstract: The project aims to design and develop 3D animated video First Responder Life Support (Choking) for baby safety. The development of this 3D animated video can help parents to understand and learn more clearly about Basic Life Support in dealing with the issue of baby choking. High risk occurs in unregistered care centers because they do not have the knowledge or equipment available in the event of an accident with the baby (Rozmi, 2002). One of the main causes of choking is due to the careless attitude of the parent when giving the baby milk and the wrong position of the baby during breastfeeding. The model used in the development of this product is the Hannafin and Peck which has three main phases namely need assessment, design and develop or implement. Each phase will go through to the evaluation and revision. The analysis phase was conducted through interviews to find out the problem. This design phase of the product, the developer creates a storyboard and gets feedback from interface and design specialists. In the development or implementation phase, the developer creates a prototype using selected hardware and software. The evaluation is carried out by two (2) specialists in a creative multimedia field from the Faculty of Technical and Vocational Education (FPTV), while one (1) content specialist who teaches the course of First Responder Life Support (Choking) for baby in civil defense. The instrument of study used is the expert checklist form. Data is analyzed using frequency and percentage method. The findings of the study found that as a whole three specialists gave a positive response to this product. The results obtained by this product can help parents to learn Basic Life Support for baby choking.

Keywords: 3D Animated Video, First Responder Life Support (Choking)

1. Introduction

First responder is the first person who responds and has skills in the life-saving process of an emergency before getting help from a medical specialist (Mehrotra *et al.,* 2004). Life support or basic life support is an effort made to rescue the victim in an emergency and to ensure that the victim is still breathing (Frame, 2010). Choking is a blockage that impedes the respiratory system through the internal

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channels of the pharynx, hypopharynx, and trachea resulting from foreign objects such as fluid and solid (Smith & Norris, 2003). According to Byard (2015) some of the causes of a baby's problems with choking are due to food, hard objects and liquids.

According to Resuscitation Council UK (2015), basic life support that can be given to infants below one year during choking are back blows, chest trust, and Cardiopulmonary resuscitation (CPR). These efforts can help the baby breathe normally by providing respiratory assistance by compressing the heart and lung. Therefore, parents need to know the basic life support skills as the first person to help in the event of a baby problem. To provide parents with the knowledge and awareness, a 3D animated video development will be developed to show the basic life support methods that can be used when the baby is suffering from choking. According to Azhar (2010), animated videos are a medium that can stimulate an individual's understanding of a concept that is difficult to explain through visualization.

Basic life support skills affect parents because most parents do not know how to do this when dealing with child problems. Then, basic life support skills should be learned by parents because these actions can influence the action of parents to prepare for an emergency (Notoatmodjo, 2010). In addition, cases of premature death of a baby in a nursing home or nursery are extremely troubling issues. The panic faced by the babysitter during an emergency such as a choking baby causes the baby to suffer from respiratory problems and cannot be saved. Breastfeeding factors also influence the occurrence of these problems. Alternatively, infants under the age of 6 months may also be at risk of choking as they are influenced by several factors in their reaction to swallowing food. In a preliminary study (2019), according to medical experts the cause of infant choking is because the baby does not know how to control the quantity of milk taken. , toys and more.

According to Azhar (2011), video animations in media learning can explain an abstract concept. In terms of education, animations used in learning media such as 3D animated videos are contained in image, motion and simulation animations. (Mayer & Moreno, 2002). The animated video is expected to help parents apply the right techniques when performing basic life support in dealing with their baby's problem. A theory that is used and applied in an application development to help applications developed to meet the needs of users. Constructivism is one of the processes of learning or knowledge that begins with cognitive conflict. The point is that knowledge gained at the end of the learning process will be an experience. There are several features of learning based on constructivism, namely learning based on experience by linking individual knowledge, providing problems with a variety of solutions based on experience, integrating learning through situations through concrete experiences, providing engaging learning, using media in learning to be more effective and engaging emotional element in learning (Karli,2003). There are three (3) objective to achieve the purpose of the study:

- Design a 3D video first responder life support (choking) for baby safety
- Develop a 3D video first responder life support (choking) for baby safety
- Test the functionality of 3D first responder life support (choking) video development

2. Methodology

Hannafin and Peck model (Figure 1) is used as a guideline for developing the product of this 3d animated video. This model has been chosen because the elements in this model are suitable for use in the product development process because this model is more organized and systematic. This model has three elements such as need assessment, design and develop or implement. Each phase will go through to the evaluation and revision.

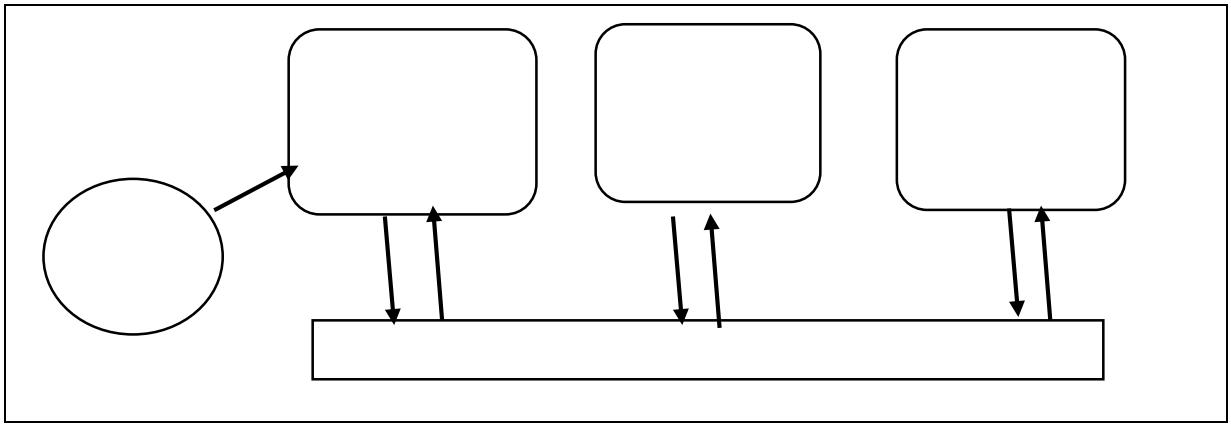


Figure 1: Hannafin and Peck Model (1988)

The selection of Hannnafin and Peck's (1988) design model in the development of 3D animated video is because it is a product-based learning model such as learning media (Baharuddin, 2001).The advantage of the model is the emphasis on the evaluation and iteration phases at each of the three main phases stated. An evaluation is done at the completion of one phase before continuing to the next phase. Evaluation and testing will be completed until the completion of the three-phase evaluation process.

2.1 Product design

Product design is very important as it explains the overall planning that is being developed in the development of the project (Chua & Akmar, 2002). This phase is the phase in which all information from the analysis process is documented. In this study, developers created a flowchart and storyboard for the development of this animated video. The three main parts of this product development need to be done are information design, interaction design, and interface design.

2.2 Contents design

Content design is the order of content in product development. Developers need to make sure content in product development is attractive in order to encourage users to use it. In this study, the developers had obtained the ideas in a preliminary study on the relevance of the content needed in the development of the animated videos. In content layout design, there is a note, and a video tutorial.

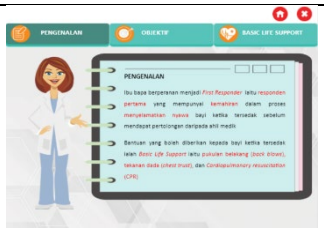
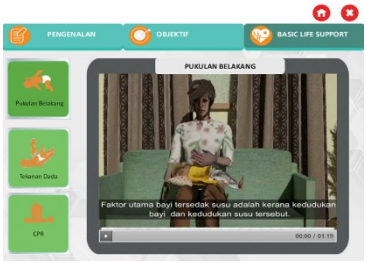
2.3 Interaction Design

Interaction design is the set of interactive elements that exist in product development. This design is very important to see how a product works. In this study, developers use multimedia and navigation elements such as navigation buttons to capture user attention and give them the opportunity to control and interact with the project.

2.4 Interface Design

Interface design is the whole set of content, multimedia and interactive elements available. This design will show the initial sketch of the product development. In this study, developers use storyboards to focus on multimedia elements and content on the development of animated videos. Through storyboards, developers will organize product development content such as the main page, home page, note interface, the video tutorial home page interface, the video tutorial subtopics display interface and exit page.

Table 1: Page Interface

Page Interface	Description
 Start page	The start page interface shows the use of text and graphic. **Graphic** - The design of the background page **Text** – Title and button name.
 Home page	The homepage interface, shows the use of text and graphic **Graphic** - The design of the background page **Text** – Title and button name.
 Introduction page	The introduction page interface, shows the use of text and graphic **Graphic** - The design of the background page **Text** – Page title and notes.
 Objective page	The objective page interface, shows the use of text and graphic **Graphic** - The design of the background page **Text** – Page title and notes.
 Video tutorial page	The video tutorial page shows the use of audio, animation, text and graphic. **Graphic**- graphic in submenu button **Text**- Title and button name **Animation**- Parents and baby **Audio**- audio of subtitle

Exit page		The exit page interface, shows the use of text and graphic **Graphic** - The design of the background page **Text** – Title and button name.

3. Findings and Discussions

Developers have made confirmation of three experts for the evaluation of the 3D animated video. As a result of the evaluation, it was analyzed using methods in frequency and percentage of acceptance. Table 2 shows findings of expert confirmation of content design. As the result of findings, (26) items have been submitted and there are (24) got the 'yes' but the other (2) items got 'no'. There are suggestions and views from an expert in relation to the content design in item 20 and 21. The expert gives the suggestion to the developer to explain instructions on rescue breathing to be easy to understand. Suhaimi (2012) states that a software with a user-friendly element can be seen when instructions and order are clear and orderly on each screen. Overall, all experts have given positive feedback on the design of the 3D animated video first responder life support (choking) for baby safety as a medium that can convey information and understanding to users about basic life support especially to parents.

Table 2: Findings of expert confirmation of content design

No	Items	Frequency		Percentage of Acceptance (%)
		Yes	No	
1.	Instructions in video of back blows follow the standards	1	0	100%
2.	Instructions in video of chest thrusts follow the standards	1	0	100%
3.	Instructions in video of Cardiopulmonary Resuscitation (CPR) (Chest compression) follow the standards	1	0	100%
4.	Instructions in video of Cardiopulmonary Resuscitation (CPR) (Open airways) follow the standards	1	0	100%
5.	Instructions in video of Cardiopulmonary Resuscitation (CPR) (Rescue Breathing) follow the standards	1	0	100%
6.	Instructions in video of Cardiopulmonary Resuscitation (CPR) (Resume Chest compression) follow the standards	1	0	100%
7.	The steps of back blows are correct	1	0	100%
8.	The steps of back blows are clear	1	0	100%
9.	The steps of back blows are easy to understand	1	0	100%
10.	The steps of chest thrusts are correct	1	0	100%
11.	The steps of chest thrusts are clear	1	0	100%
12.	The steps of chest thrusts are easy to understand	1	0	100%
13.	The steps of Cardiopulmonary Resuscitation (CPR) (Chest compression) are correct	1	0	100%
14.	The steps of Cardiopulmonary Resuscitation (CPR) (Chest compression) are clear	1	0	100%

15.	The steps of Cardiopulmonary Resuscitation (CPR) (Chest compression) are easy to understand	1	0	100%
16.	The steps Cardiopulmonary Resuscitation (CPR) (open airways) are correct	1	0	100%
17.	The steps Cardiopulmonary Resuscitation (CPR) (open airways) are clear	1	0	100%
18.	The steps Cardiopulmonary Resuscitation (CPR) (open airways) are easy to understand	1	0	100%
19.	The steps Cardiopulmonary Resuscitation (CPR) (rescue breathing) are correct	1	0	100%
20.	The steps of Cardiopulmonary Resuscitation (CPR) (rescue breathing) are clear	0	1	0%
21.	The steps of Cardiopulmonary Resuscitation (CPR) (rescue breathing) are easy to understand	0	1	0%
22.	The steps of Cardiopulmonary Resuscitation (CPR) (Resume Chest compression) are correct	1	0	100%
23.	The steps of Cardiopulmonary Resuscitation (CPR) (Resume Chest compression) are clear	1	0	100%
24.	The steps of Cardiopulmonary Resuscitation (CPR) (Resume Chest compression) are easy to understand	1	0	100%
25.	The audio used is clear	1	0	100%
26.	The audio used is easy to understand	1	0	100%

Table 3 shows findings of expert confirmation of content design. As the result of findings, all experts agree to all the items described in the expert checklist form. The use of navigation in the application gets support and agreement by all experts in which they agree that navigation and navigation option works well, so the user can achieve any information in a particular order. Then all experts also agree that the inserted audio and video can be played well. Overall, the element of interactivity applied by developers in this 3d animated video can help users to freely choose the video they want. This is because, according to Vaughan (2004) and Aris et al., (2001) interactivity helps users to be more active and control media travel when using multimedia software.

Table 3: Findings of expert confirmation of interaction design

No	Items	Frequency		Percentage of Acceptance (%)
		Yes	No	
	Interaction Design			
1.	Navigation options work well	2	0	100%
2.	Audio works well	2	0	100%
3.	Video works well	2	0	100%
4.	Navigation works well	2	0	100%

Based on the findings of the evaluation, all experts agree that interface design can meet the target needs of the users (Table 3). This can be proven when mostly all items on the form of expert checklist of the interface section receive the answer “yes” by the experts. However (6) items got “No” in items of text and graphic. The expert gives a suggestion and views in relation to interface design which is to improve the colour of graphic, button and change the layout. According to Aris et al. (2002) graphic images that contra with the background can attract users. Beside the expert also suggesting to ensure the colour of the highlight text is clear and appropriate. Font types and colours need to be appropriate,

consistent and easy to read in order to convey information effectively (Jamaluddin and Tasir, 2003). Overall, the experts agree that interface design of this 3d animated video is good and appropriate with the user.

Table 3: Findings of expert confirmation of interface design

No	Items	Frequency		Percentage Of Acceptance (%)
		Yes	No	
	Text			
1.	The type of text is easy to read	1	1	50%
2.	The type of text and background are right	1	1	50%
3.	The type of text is appropriate	2	0	100%
4.	The color of the text is appropriate	1	1	50%
5.	The size of the text is appropriate	2	0	100%
6.	Text positioning is consistent	2	0	100%
	Video			
7.	The audio used in the video is appropriate	2	0	100%
8.	The captions on the video are easy to read	2	0	100%
9.	Video length is appropriate	2	0	100%
10	The navigation of the video is well controlled	2	0	100%
11.	The video movement in order	2	0	100%
12.	The video is clear	2	0	100%
13.	The video is interesting	2	0	100%
14.	The video is appropriate	2	0	100%
	Graphic			
15.	The background is interesting	1	1	50%
16.	Design of button is consistent	2	0	100%
17.	The graphics used are interesting	1	1	50%
18.	The graphs used are appropriate	2	0	100%
19.	The graphic resolution used is appropriate	2	0	100%
20.	The colour of the graphics is interesting.	1	1	50%
21.	The icons is appropriate	2	0	100%
22.	The position of the graphic is appropriate	2	0	100%
	Animation			
23.	Animation used appropriately	2	0	100%
24.	The animation is clear	2	0	100%
25.	The movement of animation works well	2	0	100%
26.	The movement of animation is clear	2	0	100%
	Audio			
27.	The audio is appropriate	2	0	100%
28.	The audio is clear	2	0	100%
29.	The audio is interesting	2	0	100%
30.	Navigation on audio is well controlled	2	0	100%

4. Conclusion

In conclusion, the questions were answered. Improvements made to any problems faced were also done. As a result of the findings of the study based on the assessment, developers found that the development of the 3D animated video First Responder Life Support (choking) for baby safety is an attractive medium and helps users in the process of learning basic life support. Comments and suggestions from experts were included in this product development in order to meet the needs and

requirements of the users. Mostly, all specialists agree to content design, interface design and interaction design for this product.

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