Research article

Developing a Prototype of Mobile-based Miko and Mila Animation Series Application Using the ADDIE Method

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Abstract.

In a previous research and development study, Dini *et al.* had produced six 2D animated series (Miko and Mila) for educating children on how to deal with child violence. The series need to be disseminated in various media. One of the media that is often used by children is an interactive mobile application. The objectives of the current research were to complete the initial three stages – specification, initiation, and design – using the ADDIE method for developing an interactive mobile application for the Miko and Mila animation series. At the initiation stage, material testing was carried out on the animated media, and the average validation score was 93.33% by media experts and 89% by material experts. The results of this stage will be used for further research in the development stage.

Keywords: mobile application, animated series, ADDIE

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1. Introduction

1.1. Background

The sexual education contribution to sexual abuse prevention against early childhood children made the researchers designed an attractive sexual education program for children. It should be accessible for both parents and children and also understandable for both of them. Animation becomes an alternative educational media selected by researchers for early childhood children. The underlying rationale is that early childhood children as digital native are more interested in interactive media with technology development. Animated video has been frequently used as knowledge and skill transfer media for children[1].

In previous research, Dini[1] have produced 6 (six) 2D animated series Miko and Mila about sexual education for children aged 3-6 years to provide an understanding of preventing sexual violence in children. Teachers are the important components to accommodate the comprehensive and additional knowledge for early childhood

children. Therefore, they must have sufficient knowledge about early childhood sexual education, plan the learning process or sexual education integrated activity, arrange sexual education media for early childhood children, and skill to evaluate the applied materials. The six 2D animated media Miko and Mila Series could be used by teachers to enrich their knowledge, be used as learning media, and arrange the media's evaluation process[1].

The development in multimedia technology promises great potential in changing, among others, (i) the way people learn, (ii) the means to obtain information, and (iii) the measures to customize information. The multimedia technology also provides various opportunities for educators to apply various teaching techniques, and learning with the use of multimedia teaching aids can attract children[2]. The media to provide to children is still in the form of animations that are played from Google Drive, this makes it difficult for children to interact and know the correct order. Researchers tried to do the initial design to change the delivery media for Miko and Mila Animation with a mobile based.

1.2. Formulation of the Problem

The formulation of the problem in this study is how to analysis and design Mobile-Based Miko and Mila Animation Series application with ADDIE method to make it more interactive and fulfil the dimensions of usability issues.

1.3. Research Purposes

The research purposes are to complete initial stages of developing a interactive mobile application for the Miko and Mila animation series using the ADDIE method, namely analysis stage (consist of specification and initiation) and design stage.

2. Literature Review

2.1. Animation

Animation is an audio-visual media and one of the types of films that are considered suitable for consumption by people from all walks of life and ages without being taught. Animation is a unique medium of information compared to other information media, there is a combination of narrative and cinematic elements in it which make it visually appealing to the audience. People think that animation is meaningful as a cartoon with

funny stories made for children, so the content considered light and gentle. Currently, animation is not created only as entertainment, but as an interesting learning media[**3**].

2.2. Mobile Learning

Community perceives mobile learning from three different points of view within the context of academic community[**4**]. First, mobile learning is new distance learning form. Second, mobile learning is an e-learning expansion as new learning way. Third, mobile learning has high mobility. Liu et al mention three mobile learning differences[**5**].

1. Providing flexible learning environment

2. Providing situational learning activities

3. Providing in-time learning content

Mobile phones are future devices for learning. However, parents should also monitor the uses of mobile phones for children. Scholars believe that usability dimension is crucial matter for users to use this technology. Thus, eases of access, learnability, ease of understanding, attractiveness, and enjoyable experience of using mobile phones are important. Mobile phones as learning media for children should have attractive interface. Thus, children as the users will be interested to interact with the application[**6**].

Mobile phone for classroom learning or teaching and learning activities have man potentials. However, many parties have not maximized the potentials, for example the use of M-learning. M-learning is an intersection of mobile computerization and e-learning technology. It integrates flexible individual learning. This learning also provides alternative of educational experience, both formal and informal, by focusing on learning experience. It also provides various learning material uniquely with its touch-screen feature[**7**].

3. Methodology

The researchers used ADDIE method to develop the multimedia application (see Figure 1)[**8**].

ADDIE model includes five stages[**9**]:

1. Analysis stage of the objects' needs of the application, both the initiation and specification, the presentation, the requested material, and the material constraint
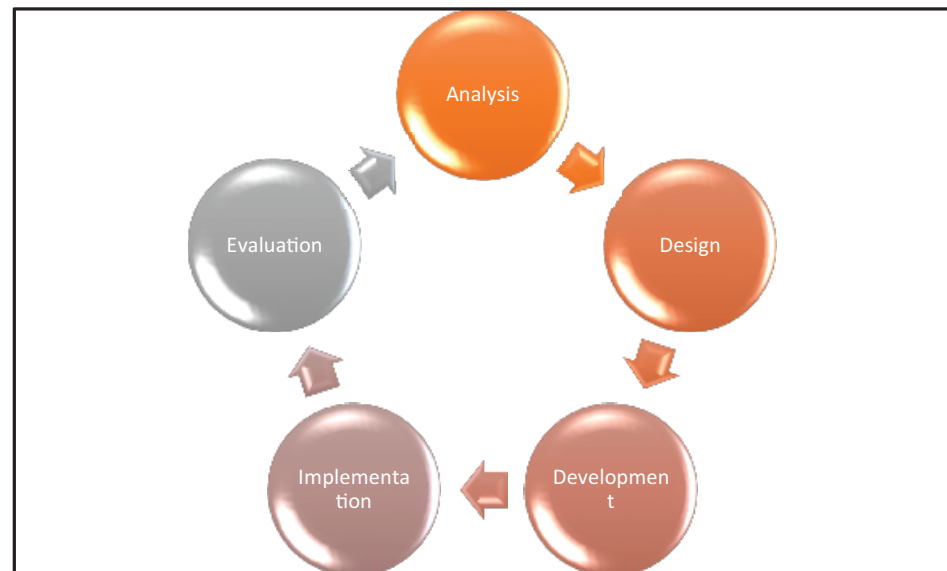
Figure 1: ADDIE Model.

2. Designing stage to determine the design and appearance of the application from aspects of material, animation, video, audio, and image visualization

3. Developing the design based on the arrangement, the design test, and storyboard

4. Implementing the design into running application to check the functionality of the components

5. Evaluating all stages based on the needs, user evaluations, functionality requirement, and bugs

This research developed an animated application as mobile learning media. In this case, the researchers used ADDIE model at the early stages: Analysis and Design.

4. Research Findings

4.1. Analysis

The researchers analysed initiation, specification, presentation, material, and material constraint for the learners aged 3-6 years old, and their teachers. The researchers developed this mobile-based application media that consisted of six animated series. The main characters are Miko, a young boy; and a girl Mila, Miko's sister. The characters are aged 5 and 6 years old.

Title of each Animation series :

Video 1 : Me and My Body

Video 2 : Safe Touch

Video 3 :Change clothes

Video 4 : Family and people around me

Video 5 : Respect Yourself and Others

Video 6 : When there is danger, what to do?

Figure 2: Cover Content of 6 (six) series Miko and Mila Animated Videos.

For the feasibility of the material and animation media created, a feasibility study needs to be done. Stages in conducting a feasibility study:

Testing the validity of the product to 2 material experts and 2 media experts respectively.

The validity of the data tested is quantitative data from the questionnaire.

Data analysis was carried out by processing expert validation sheet questionnaires using percentages.

The validity of this research emphasizes the validity of the content of the material. The criteria for validation of the design and material aspects can be converted into qualitative data according to the validity category according to**[4]** by looking at the validity level interval**[10]**.
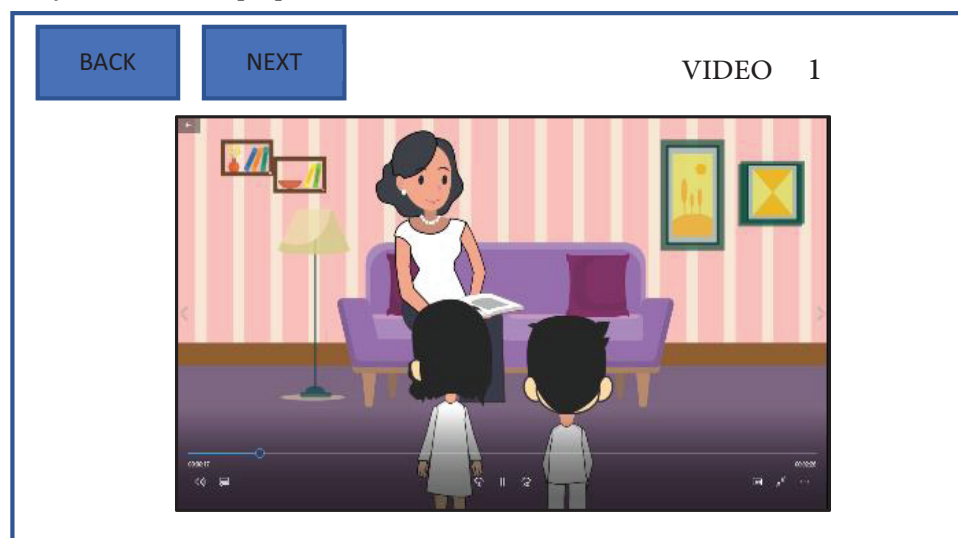
TABLE 1: Validity of the product by media experts.

	Val. 1	Val.2
General Appearance		
1. Media design according to material	5	5
2. Media design is in accordance with the concept of preventing sexual violence in early childhood	5	4
3. Media design is eye-catching	4	5
4. Media design presents real examples	5	5
Custom Appearance		
5. Color selection in media	5	5
6. The attractiveness of the characters used in the animation	4	4
7. Accuracy of sound or music in animation	5	5
8. Matching order between animation frames	5	5
9. Appropriate size of images and text used in animation	4	5
10. Image focus	5	4
Presentation		
1S1. Easy access to the media format used	4	4
12. Media packaging according to material integration 5 5	5	5
Total	56	56
Percentage	93,33%	93,33%
Average : 93.33%		

From the results of the validation of media experts, the average value was 93.33% and from material experts 89%, then the criteria were very valid, can be used without revision.

4.2. Design

The design of the application included the shape, appearance, object, and display of the background bas on the material, animation, video, audio, and image visualization. The researchers used UML case diagram to describe the actor-system interaction correlation. This diagram was also useful to determine the system functionality so that actors could interact with the system. Then, the component describes the communication in the system so that users could use it and understand it[11].

The designers sketched and created the storyboard. These processes were important to create the characters, clarify the icons, and create interface of the application (see Figure 4).

At this stage, the researcher draws a storyboard which is divided into 9 scenes where scene 1 contains a menu with a 3 button design containing videos, profiles and exits. In Scene 1: Menu, a picture of the main characters in the video will be shown, namely Miko

TABLE 2: Validity of the product by material experts.

|	Val. 1	Val.2
Format		
1. The simplicity of the material presented in the animation	4	5
2. The suitability of the display of images and sounds in animation	5	4
Contents		
3. The suitability of the animation concept with indicators	4	4
4. The suitability of the animation material with the aim of	4	5
5. The meaning of the message	4	5
6. Completeness of information presented in animation	5	4
7. Ease of understanding the material presented in the animation	5	5
Language		
8. Use of language that is easy to understand	5	4
9. Use of language that matches Indonesian spelling	4	5
10. The language used is in accordance with the target	4	4
Total	44	45
Percentage	88%	90%
Average : 89%		
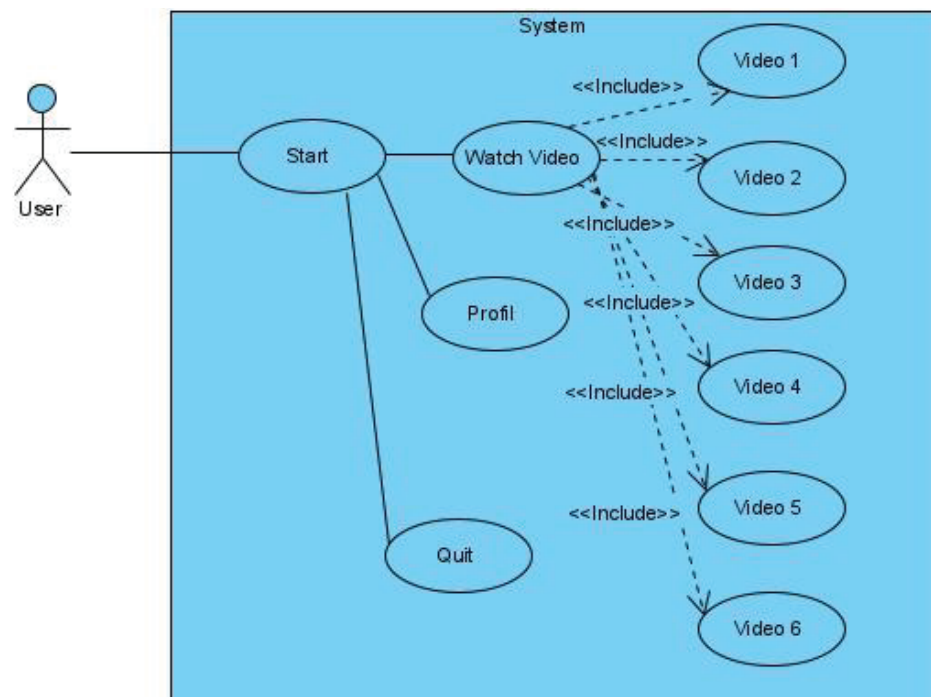
Figure 3: The diagram case of Miko-Mila application.

and Mila. For Scene 2: Profile, it will explain how to use and developer the app, Scene
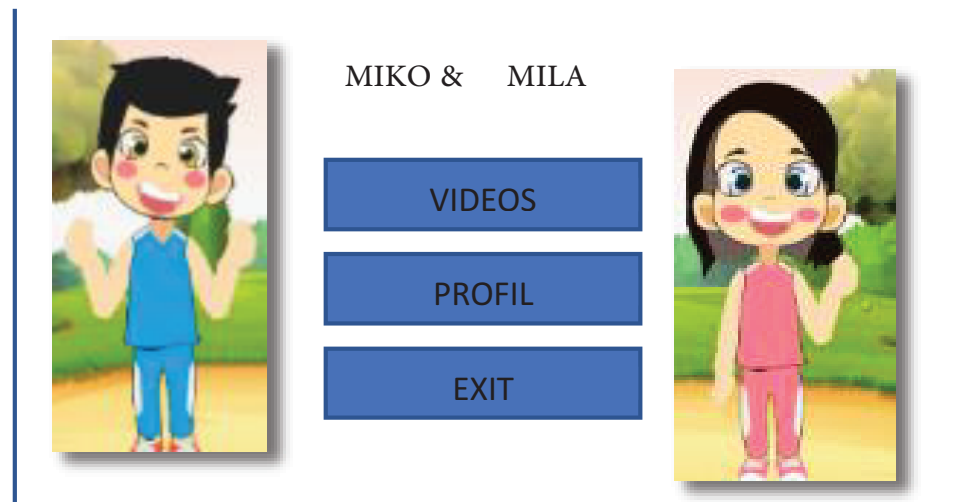
Figure 4: Main menu and video menu design interface.

3-9: Video, contains a sequence of animated videos of Miko and Mila from Titles 1 to 6 in the order according to the learning achievement. There is a back and next button.

The development specification plan uses Unity 2D software, which has been set on the Mobile (Android) platform, so that the output of the product is an application with an .apk extension. The screen size does not use fixed pixels but with a 16:9 scale (horizontal mobile position) to make it easier for students to view the videos.

5. Conclusions

This research and development only carried out the initial stages of developing the app which used the ADDIE method, especially at the Analysis and Design stage. At the analysis stage of the 6 videos that have been made, the researcher conducted a feasibility test on the product. The feasibility study is carried out on the media section by media experts and on the material section by material experts or academics. The result is average 93,33% and 89% with the conclusion that this content is feasible and does not need to be revised again. At the design stage, the user interaction with the system is described using a use case diagram. As for the display, a storyboard is made for each scene that will be developed so as to produce a mobile application. For further work, it is necessary to continue the ADDIE method which is to start developing the application.

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