

# Designing of Learning Media in Productive Lesson by Using Human Computer Interaction (HCI) Approach

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**Abstract**— State Vocational School 1 Miri opened the department of multimedia with one of the productive subjects of multimedia learning competencies including Image Capturing Production, Graphic Design Printing, Audio Video, 2D and 3D Animation, PKK (Entrepreneurship Creative Products), and Computer Assembly. Productive subjects 2D and 3D animation is one of the applied subjects of theoretical practice that focuses on the application of tweening animation techniques. To produce a good animated film, learning theory and practice given in class is not enough, additional materials and tools are needed that are interestingly packaged and can be used as learning media for students to better understand how to make the right animation. Android-based learning media design aims to produce an application interface that is easy to use, comfortable, and easy for users to operate the learning media. The design of instructional media with the HCI approach helps the developer in achieving user friendly designs according to HCI factors in Mobile-based applications. Based on observations made in class XI MM 2 with a total of 36 students, all students already have an Android smartphone. Seeing this potential, learning media by utilizing smartphones is by making an Android-based learning media design.

**Keywords**— *design, learning media, HCI, mobile*

## I. INTRODUCTION

The teaching and learning process is the basic activity of the school educational process, because there is communication between students, teachers and teaching materials as a reference [1]. The concept of education for children is important. The aspects that must be considered are methods and learning media [2]. Recently, a lot of efforts reported in HCI literature have been devoted to exploring how students interact using computer-mediated mechanisms [3]. Productive subjects 2 Dimensions and 3 Dimensions animation is one of the applied subjects in SMK Negeri 1 Miri, especially in multimedia expertise competencies. These subjects are theoretical and practical, focusing on 2D and 3D software, where students are expected to be able to make simple animated films. To produce a good animated film, students need to practice and apply theoretical and practical material done at school during learning hours is not enough. There must be additional material that is packaged attractively and flexibly. The learning media used are also not rigid and flexible so that they can be accessed anytime and anywhere. Audio visual presentation will make visualization more attractive, innovative and interactive [4].

Media-based learning media are usually termed multimedia. Multimedia is a collection of computer-based media and communication systems that have the role to build, store, deliver and receive information in the form of text, graphics, audio, video and so on. Multimedia in a

computer context is also used to present and combine text, sound, images, animations and videos with tools and connections or links so that users can navigate, interact, work and communicate [5]. (HCI) community has shown an increasing interest in studying animation [6]. Android-based multimedia used in learning media makes learning interesting than conventional information in the form of text by displaying animation, both audio and visual, which was developed with Adobe Flash and Android Smartphones. The design of instructional media with the HCI approach helps the developers in achieving user friendly designs according to HCI factors in Mobile-based applications. Based on observations made in class XI MM 2 with a total of 36 students, all students already have an Android smartphone.

The formulation of the problem is How to design Android-Based Learning Media Using Adobe Flash CS6. Adobe Flash CS 6 is a computer application that is used to create reliable animations so that flash is more desirable and is used to create and provide interactive or non-interactive animation effects [7]. For 2 Dimension and 3 Dimension Animation Subjects with Basic Competencies Implementing 2D Tweening Animation Techniques for Multimedia Skills Competencies in SMK Negeri 1 Miri. The research focus using the curriculum of learning material used is Curriculum K13 REVISION multimedia for class XI. d. The basic competencies contained in this learning media include all the Basic Competencies in Applying 2D Tweening Animation Techniques.

## II. METHOD

The development of this instructional media adapts the ADDIE development model, which is a development model consisting of five stages consisting of Analysis, Design, Development, Implementation and Evaluating (evaluation) [8]. The following are 2 of the stages of system development using the ADDIE method used in this study, namely: (1) the stage of hardware and software requirements analysis; (2) Design stages, the process of making storyboards, determining learning materials, compiling questions and answers, collecting backgrounds, fonts, backsounds, images and buttons and flowcharts for learning media to be created [9].

The HCI criteria used cover learnability measurement, efficiency, memorability and satisfaction [10]. This research was conducted at Miri I Public Vocational School located on Street Gemolong - Karanggede kilometer 2, Jeruk, Miri, Sragen for ± 3 months of implementation.

III. RESULT

The learning process that the authors observe is in the learning process with 2D and 3D Animation Techniques with the results of the learning process going well, but the material being taught is a combination of theory and practice, so students are required to be able to practice all the theories being taught, existing constraints is the attractiveness of students towards the theory taught is different. Following illustration shown fig 1 as below.

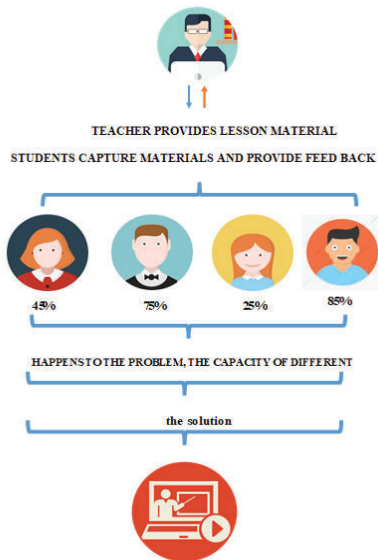


Fig. 1. The Learning Process Is Ongoing

A. Requirements Analysis

Class XI Vocational School students majoring in multimedia in the teaching and learning process in general are still using the old way, namely the teacher explains the material and students listen and record important things [10]. But it becomes a problem if the material presented requires practice, such as learning materials in 2D and 3D animation techniques, which are studied by students of XI multimedia. The material is applied material that must be practiced in the learning process, but in its implementation it is hampered due to differences in students absorbing capacity in receiving learning material delivered by the teacher, and that results in students becoming less understanding. On the other hand the number of media practices in terms of Computers, do not meet the standard ratio of the ratio of the number of students and practice tools, which is ideally one to one so that in the practice activities the material becomes inhibited and disadvantages students.

Hardware requirement analysis consists of a computer with minimal specifications Operating System Windows 10, Processor Intel® Core™ i-3-2330M CPU @2.20Ghz, Ram DDR3 4 GB & SSD 128 GB and the consists of smartphone or tablet with the specifications RAM 512 MB, Quad Core Proesor, OS Android and IPS LCD capacitive touchscreen. Software requirement analysis consists of computer OS Microsoft Windows 10, Adobe Flash Professional Cs 6, Adobe Encoder Cs 6, Corel Draw X6, Camtasia Studio 7, Adobe Phothoshop Cs 6, and Adobe Premiere Cs 6. Software requirements for application are android 4.2 and adobe air.

B. Navigation Structure

The navigation structure describes the relationship between some content and helps organize content with messages. The navigation structure used in making this application is to use the hierarchical menu structure. From the design of the navigation structure in the form of a picture of the relationship between Frame and Page that we can see in the following image. Navigation structure shown in Fig. 2.

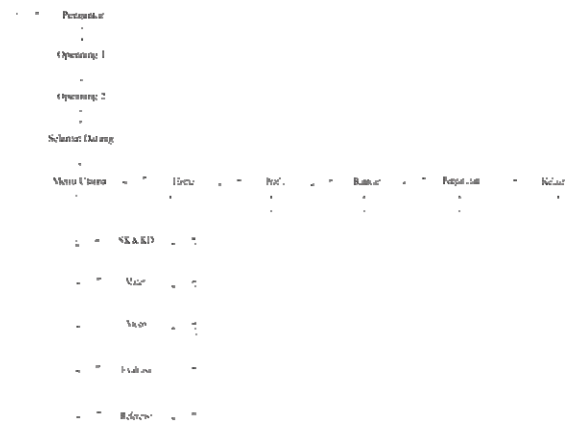


Fig. 2. Navigation Structure

C. Design Interface

The images presented in the media were partly designed using the HCI approach. Images are combined with images downloaded from various sources with regard to HCI factors. The collection of images, fonts and buttons are mostly downloaded from the dafont.com web and icon finder. Making and combining images is done using the photoshop CS 4 programs. Most images are created in portable network graphics (.png) format because images with a .png format can be made with a transparent background so that it will make the media more attractive and beautify the look of the media, design interface on the process of making an application shown in Fig. 3.

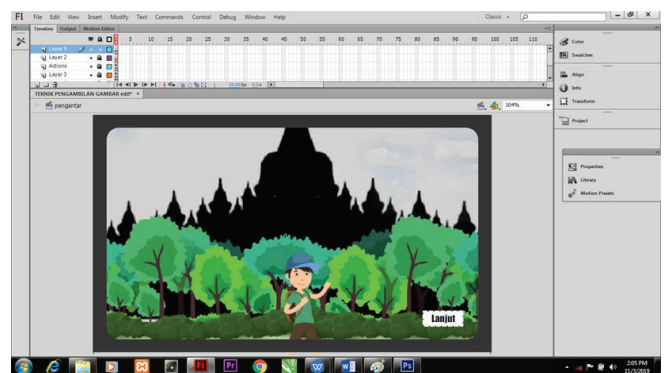


Fig. 3. Picture on Adobe Flash

Human Computer Interaction (HCI) is a multidisciplinary that focuses on the design, evaluation and implementation of computer system interactions used by humans and other things around them [11]. Ease of use (usability) is a crucial issue in HCI, because it becomes an important aspect to assess the quality of the user interface [12]. adding the main focus on HCI is how humans use computers as tools to do, simplify and support their work. Usability requirements of a product, including the internet and computer systems can be

identified if the product is designed according to user needs. Usability evaluation goes hand in hand with the familiarity of HCI, the user interface of main menu shown in Fig. 4.

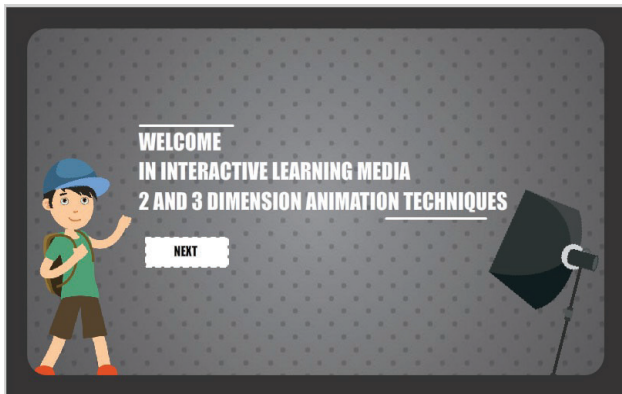


Fig. 4. Main Menu

From the figure 4, if button Next in the click then shown in Fig. 5, Figure 5 contains animation techniques consisting of 5 information, KI and KD, Theory, Video, Quiz and Reference.

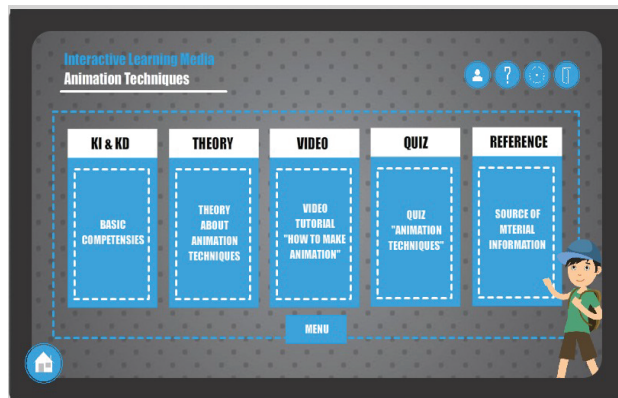


Fig. 5. Animation Technique

From the HCI approach comes the assessment of students' satisfaction with learning media design:

Table 1. Recapitulation of Assessment

No	Kategori	Rata-rata
1	Learnability Measurement	76 %
2	Efficiency	87 %
3	Memorability	90 %
4	Satisfaction	84%

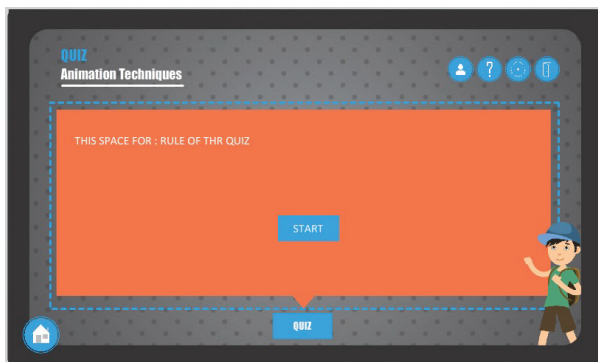


Fig. 6. Rule of Quiz Design

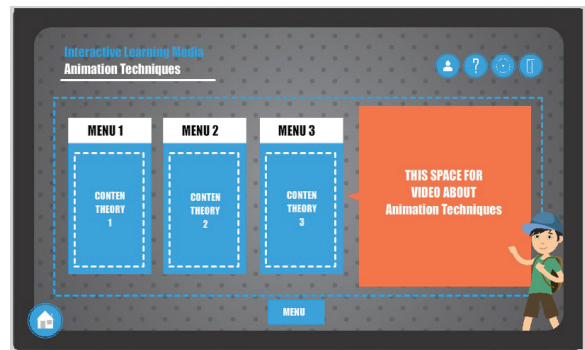


Fig. 7. Reference Design

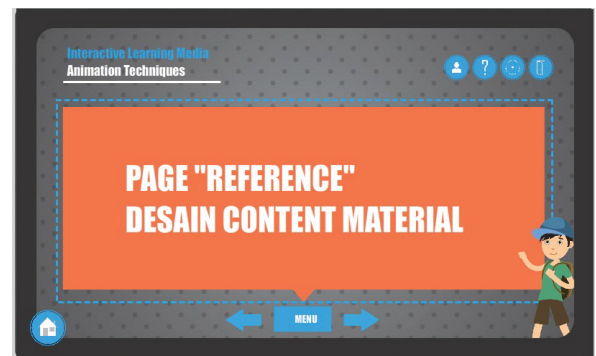


Fig. 8. Reference Design

#### IV. CONCLUSION

Based on the results of the research and discussion presented in the previous chapter, the conclusions in the design of 2D and 3D animation learning media with the HCI approach are as follows: the combination of colors and ease of button access is needed to facilitate the use of learning media. Learning media designed based on Android and can be used by students because the majority of students already have a smartphone. In designing the instructional media, the writer uses the ADDIE development model.

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