Designing Software to Introduce the Musical Instruments

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Abstract. Identify music equipment is an early stage in the process of learning music, both for theoretical and practical purposes. How the instructor introduces musical instruments is shows the instrument physically. But the way to introduce this is very limited to the tools that are available and relatively inexpensive, such as guitars, violins, and the like. Multimedia computers are now widely used to introduce a particular topic of discussion. One of them is a program that can introduce and teach various types of musical instruments. This software usually contains theory and information about a musical instrument and to test user knowledge, it can be tested through quizzes in this program where all the questions displayed are related to musical instruments. The implementation of this paper is a program that can display musical instruments, sounds, history, and information about this instrument. In addition, there is usually an interactivity like a quiz that can display quizzes about musical instruments by playing their voices and asking where these musical instruments originated.

1. Introduction

Computers now developed into a multimedia device where it is not only used to process data but it can be used for entertainment and education [1]–[4]. Currently in the market there are many circulating software such as education games intended for children both pre-school and those who have gone to school[5]. Multimedia related to computer science which is a form for present the information using a combination of text, sound, images, animation, and video [6]. Some forms of applications from computer multimedia include games, learning software, and reference materials, such as encyclopedia. Most multimedia applications include a predefined association known as a hyperlink, which allows users to exchange media elements and topics [7][8].

This software category is used to train children's thinking, teaching counting, recognizing patterns and forms, drawing and coloring programs and others. This software is packaged in compact discs plus multimedia facilities so that children who use this program are not bored [9]. Multimedia software is widely used today, one of which is an application to know musical instruments [10]. In this application the program can display musical instruments, sounds, history, and information about this instrument. In addition, there is usually an interactivity like a quiz that can display quizzes about musical instruments by playing their voices and asking what the instrument is [11].
2. Related Works
In its development, multimedia has been widely applied in fields such as News, Broadcasting and Advertising, where the use of interactive television and increasing WWW capabilities (including Web TV and webcasting) to broadcast information, media has added an interesting new dimension to traditional approaches [12]. The interactive outlook of the Web can assist news providers enrich traditional content that is generally text-based by providing direct reports and video clips, advanced searches and “push” technology and news available 24 hours a day, 7 days a week.

3. Research Methodology
3.1. Designing System
In the design phase of the system development life cycle, the system analyzer uses information collected previously to achieve logical application design. The analyst designs a data-entry procedure such that the input entered into the system can be easily carried out [13][14]. In addition, the analyzer used certain screen form and design techniques to ensure the effectiveness of the system input. Part of the system design logical information is the user interface equipment. The interface connects users with the system, so the role is really very important. An example of a user interface is the keyboard (for typing questions and answers), menus on the screen (to bring user commands), as well as various types of Graphical User Interfaces (GUIs) that use the mouse or enough with the keyboard.

3.2. Testing System
Before the system can be used, it must be tested first. It will save costs if you can catch a problem before the system is established [15][16]. Some tests are carried out by the programmer themselves, and others are done by the system analyzer. This test series is first run together with sample data and with the actual data from the existing system[17][18].

3.3. System Analysis
The introduction and learning program of musical instruments developed in this paper is named Learning Musical Instruments [19]. The Musical Instrument Learning Program consists of a musical instrument recognition module for the four categories of musical instruments along with a quiz to test the user's knowledge based on the sound of the instrument. This Musical Instrument Learning Program was developed with the Visual Basic 6.0 programming language and animations made with the SwishMax program to produce music and animation.

In the software designed to discuss about an application for the introduction of musical instruments aimed at children with the intent and purpose of making children more about musical instruments based on their distribution. In addition to displaying images and information related to the intricacies of each musical instrument, the user will also be introduced to the sound of this instrument.

3.4. Instrument
This program is run using hardware that has the minimum specifications as follows:
1. Processor Intel Pentium IV 2.0 GHz
2. Memory 256 MB
3. Harddisk 40 GB
4. Monitor with 1024 x 768 pixel resolution
5. Mouse and Keyboard
6. Speaker

The softwares that can be used to run this application are Windows 98 SE, Windows ME, Windows NT 4.0, Windows 2000, or Windows XP and Macromedia Flash Player software.

3.5. Algorithm
An algorithm is a structured step in solving a problem. Algorithms in this program can be outlined in the form of flow charts so that the workings of the programs designed can be easily understood [19]. Algorithms in this program can be outlined in two parts, namely the selected menu algorithm and the randomization algorithm.
a. Selected Menu Algorithm

```vbnet
Select Case
Case "Topik": Tampilkan Form Topik
Case "Kuis": Tampilkan Form Kuis
Case "Reluar": End
End Select
```

b. Question Randomization Algorithm

```vbnet
i = Rnd * 100
If Showed(i) = False Then
    Showed(i) = True
    JumlahSoal = JumlahSoal - 1
    lblSoal.Text = Quiz(i).Pertanyaan
    Option1.Caption = Quiz(i).Opsi1
    Option2.Caption = Quiz(i).Opsi2
    Option3.Caption = Quiz(i).Opsi3
    Option4.Caption = Quiz(i).Opsi4
Else
    Call GenerateQuestion
End If
```

Furthermore, if the observation can be predicted with certainty, require further investigation.

4. Result and Discussion

4.1. System Analysis

The group of musical instruments in the menu will be grouped into five parts, namely the aero phone group, chordo phones, electro phones, idio phones, and membrano phones. Information on the aerophone category will display information about musical instruments: Concert Flute, Ocarina, Piccolo, Panpipe, Tenor Saxophone, Bassoon, Clarinets, Oboe, Accordion, Harmonica, Tuba, Trombone, Trumpet, and Cornet.

Information on the chordophone category will display information about musical instruments: Qin, Nigerian Raft Zither, Valiha, Harpsichord, Grand Piano, Irish Harp, Saung-Gauk, Sitar, Balalaika, Ud, Classical Guitar, Electric Guitar, Viola, Violin and Cello. Information about the Electrophe category will display information about electone musical instruments only. Information about the idiophone category will display information about musical instruments: Cymbals, Cabaca, Maracas, Thumb Piano, and Gong. Information about the membranophone category will display information about musical instruments: Tabor, Kalengo, Tambourine, Rattle Drums, and Snare Drums [20].

4.2. Designing the Scene with SWiSHMax

SWiSHmax is an alternative program for making flash animations instantly. For the first time, complex text effects can be made in a very short time using this application. Initially SWiSHmax was assisted the application program to create animation effects for Flash applications but now this application has developed into a standalone animation maker program that is capable of running .swf animation files without running an external player or browser. In general, the animation files created using Swish will be saved in the .swi format. To produce a flash-compatible format, SWiSHmax is able to export it to a .swf format which is able to compress image, sound, including vector formats, and scaleable graphics with very small file sizes [21].

SWiSHmax is very easy to use and can produce complex animations for text, images, graphics and sound with very short creation times. In this version SWiSHmax has built-in effects such as Explode, Vortex, 3D Spin, Snake, and more. SWiSHmax has tools for forming lines, rectangles, ellipses, Bezier curves, motion paths, sprites, rollover buttons and input forms using an easy-to-use user interface. The following is a display form of the SWiSHmax application along with an explanation of the form of the user interface of SwiSHmax [22].
To design and create an animation page a scene must be formed because the SWiSHmax animation page is displayed for each scene. The scene consists of objects, text, effects, sound, events, and actions that form an animated unit in a number of frames. After completing a scene, the next scene will be run automatically.

In this instrument recognition program, several scenes will be designed where the main scene is the menu for navigating to the next scene. To form and add new scenes can be done through the Insert menu → Scene or by right-clicking on the Outline window. After the scene is formed, objects such as sound, images, graphics, text, lines, and geometry objects can be inserted into the scene. After that you can also specify the basic color of the Scene by selecting in the Movie: Background Color section.

4.3. Display of the Program
To run this program, you can simply click on the AlatMusik.exe file, after the program is loaded it will display the opening screen which is a menu display. In the display of this menu once displayed, it will play some sounds of musical instruments randomly. In this display there are five display buttons such as the "Topic" button which is used to display the topic form which contains all information and information about musical instruments. The second button is the "Quiz" button which is used to bring up the quiz form to test the user's knowledge in the field of musical instruments. The third button is "Sound" which is used to display the sound of 128 musical instruments, the fourth button is the button "High Score" which is used to display the high score quiz results. While the last button is the "Exit" button used to exit this program [23] [24] [25].

5. Conclusion
From the results of the study, the authors can draw some conclusions including:
1. Program designed by this author can display learning about musical instruments.
2. This application recognized the instrument and display various information about type, shape, and distribution of musical instruments with illustrations in images and animations and sounds.
3. By utilizing multimedia facilities and several applications to create animation, sound, and video editing, the design of multimedia applications such as this learning program is easier and faster.
4. The program designed can be categorized as one of the CAI programs that provide learning about musical instruments.
5. The results of designing this application can be used as a program to introduce musical instruments.
6. Computer-assisted learning tools with multimedia approaches can increase learning interest in students, especially regarding musical instruments.

Figure 1. Display of SWiSHmax Program
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