Drug abuse prevention model using ADDIE and CBT for primary school students

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Abstract

This research aims to create and describe a model using ADDIE Approach and CBT equipped with educative games in preventing drug abuse. The study used qualitative research and ADDIE model for instructional design involved 32 subjects including 5 principles, 5 teachers, and 22 students. The final result of this research shows that the students stated agree (80%), stated good (70%), stated attractive (85%), and stated helpful (100%) in preventing drug abuse. In conclusion, the developed application can be considered as meeting criteria for interactive application, based on the users' perspective.

Keywords: Training, Drug, Abuse, Prevention, Students.

Modelo de prevención del abuso de drogas utilizando ADDIE y CBT para estudiantes de primaria

Resumen

Esta investigación tiene como objetivo crear y describir un modelo utilizando el enfoque ADDIE y la TCC equipados con juegos educativos para prevenir el abuso de drogas. El estudio utilizó investigación cualitativa y el modelo ADDIE para el diseño educativo involucró a 32 sujetos, incluidos 5 directores, 5 profesores y 22 estudiantes. El resultado final de esta investigación muestra que los estudiantes declararon estar de acuerdo (80%), declarados buenos (70%), declarados atractivos (85%) y declarados útiles (100%) para prevenir el abuso de drogas. En conclusión, se puede considerar que la aplicación desarrollada cumple con los criterios para la aplicación interactiva, según la perspectiva de los usuarios.

Palabras clave: Entrenamiento, Drogas, Abuso, Prevención, Estudiantes.

1. INTRODUCTION

In 2002, the drug problem in Southeast and Southwest Asia was serious, particularly in the production of opium and heroin in Afghanistan, Myanmar, and Laos, the three largest producers of illicit opium in the world (Kulsudjarit, 2004). Southeast and East Asia have become a global hub for methamphetamine production and trafficking over the past decade (Mcketin et al., 2008). Indonesia, an ongoing government war on drugs has resulted in numerous arrests and anecdotal reports of abuse in detention, but to date, there has been little documentation or analysis of this issue (Davis et al., 2009). The

concept of extraordinary crime is a common and wider concept in the Indonesian legal system. The concept is used for some crimes in legislations including gross violation of human right, corruption, terrorism, and child sexual abuse offenses (Prahassacitta, 2017).

Although a major public health and social concern globally, limited data exist on substance use and their effects among adolescents living in low- and middle-income countries. Machali (2016) stated that schools play an important role in countering drug abuse since it is a gathering place of young people, often targeted by drug dealers.

One of the efforts to develop drug abuse prevention program in schools is the integration of learning aspects on drug prevention in subject materials, considering that to date, drug abuse prevention has not entered the structures of 2013 National Curriculum. Indonesian government assigned a new curriculum in 2013, namely Curriculum of 2013. There are four core target competencies in Curriculum 2013 across all levels of schooling. All subjects refer to (1) religious attitudes; (2) social attitudes; (3) knowledge; and (4) the application of knowledge (Park, 2017). In addition, in the 2013 curriculum, competency standards are developed on the basis of needs. The term instructional design refers to the systematic and professional planning and implementation of education or training. In the 21st century, educators are utilizing emerging technologies to develop not only knowledge of graduates, but also their soft skills in order to enhance competencies parallel with employer's requirements (Nadiyah & Faaizah, 2015).

The case raised in this research was the drug abuse issue. Materials included general information on types of drugs, their effects on health and future of their users, and solutions to prevent drug abuse. As a supplement to the application, an interactive game was added, which can simultaneously function to measure students' knowledge and understanding of the subject matter discussed. This application was designed by using Macromedia Flash and Action Script to help define control on interaction with students.

2. RESEARCH METHOD

The study used qualitative research and ADDIE model for instructional design involved 32 subjects including 5 principles, 5 teachers, and 22 students. The data were taken by interviewing, observation, and documentation. The model was tested to 22 students to observe application content. The procedure of the ADDIE model is described in Figure 1 as follow.
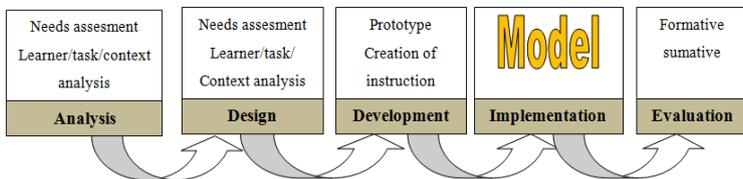

Figure 1: ADDIE Model for Instructional Design

ADDIE model in developing a multimedia product for learning has been widely known. ADDIE as one of the methods of multimedia application development for Computer Based Training (CBT) products. ADDIE is also used in developing a multimedia-based website and other multimedia-based learning applications.

3. LITERATURE REVIEW

3.1. Computer Based Training and Interactive Multimedia

With the recent innovation of enhancing the Internet speed, sharing multimedia contents including image, audio, animation, and video has been much easier. Computer Based Training (CBT) is a kind of presentation of training and education material through the computer. CBT can exist in various forms, starting from simple information presentation in the form of texts, images, videos, audios, and feedback interactions from users. One of the presentation forms in CBT is a multimedia product. Learning method innovation will influence learning media used and it is hoped to improve learning qualities (Arono, 2014). Interactive multimedia is a dynamic technology requiring certain inputs from its users to deliver a group of information through texts, graphs, images, or videos. Usually, an interactive multimedia application is designed to display certain results and to give quick feedbacks, dependent on the computer type or the interface display accessed by the user.

These include the multimedia principle (using both words and pictures), the coherence principle (avoiding extraneous media), the modality principle (using narration rather than text), the spatial contiguity principle (placing words and pictures close together), and the temporal contiguity principle (presenting words and pictures at the same time) (Evans & Gibbons, 2007).

3.2. Instructional Design with the ADDIE Model

Instructional design is a general term for a family of systematic methods for planning, developing, evaluating and managing the instructional process effectively in order to promote successful learning by students (Ozdilek & Robeck, 2009). ADDIE is an instructional systems design model that presents a series of iterative steps for building effective education and training in five phases: analysis, design, development, implementation, and evaluation (Almomen et al., 2016). ADDIE is an instructional design model consisting of a general process which is traditionally used by instructional designer or training developer. ADDIE model is the core of instructional design and becomes the foundation of the instructional design system. There are several adaptations in its practice but generally consists of 5 phases forming a cycle, which are analysis, design, development, implementation, and evaluation. The analysis is the phase in which a problem has been identified and the designer must determine what needs to be done.

3.3. Multimedia application development

Material to be used in this development is about the dangers of drug abuse and its solution for Primary School students. This material is selected based on some considerations, which are the fact that drug abuse prevention has become an important issue which students need to understand, because of the rise in numbers of drug abuse victims and its spread in demography to include people from various groups of age.

4. FINDING AND DISCUSSION

4.1. Respondents Profile

The study involved 32 subjects including 5 principles, 5 teachers, and 22 students as described in Table 1.

Table 1: Respondents Profile

Demographics		Frequency	Percent
Gender	Male	14	44
	Female	18	56
Profession	Principals	5	16
	Teachers	5	16
	Student	22	68
School location	City	3	60
	Rural	2	40
Age	Under 34 years	23	72
	35 - 39 years	2	6
	40 - 44 years	3	9

45 - 50 years	2	6
51 - 55 years	0	0
more than 55 years	2	6

4.2. ADDIE Model Application

Based on the scope of subject materials to be presented, plans and implementation of multimedia application development based on ADDIE approach were designed. In each step, research and brief observation were conducted to determine the scope of the application be developed. The research was conducted based on observation results and discussions with several teachers. Results of each phase are presented in Table 2 below.

Table 2: Stages of Development Based on ADDIE

Phase	Activity	Results
Analysis	Who is the target audience?	Senior students of Primary School
	How much is the budget?	Not defined, development is independent
	What options are available to present the subject material?	Information kiosk or laptop computer
	What obstacles are present?	The computer should support multimedia features (equipped with audio)
	When should the project be finished?	Before reaching the material to be taught.
	What should the students do to understand their competence?	By answering questions from teachers or playing digital games

Design	Selecting the most suitable learning environment by learning types of cognitive skills	Learning can be conducted in an independent environment in form of information kiosk application or in groups inside the classroom.
	Writing instructional objectives	Instructional objectives: to understand the definition, types, dangers, and ways to prevent drug abuse.
	Selecting an overall approach, program forms, and program display	Approach: illustration equipped with graphs, animated videos, pictures, and other videos.
	Designing specific course material	To raise awareness of the dangers of drug abuse. Information about the effects of drug addiction is provided. To make students more interested, a digital game is included, functioning also as a tool of evaluation on learning. Design of material covers: Display of general information about drug abuse prevention. Types of drugs circulating, with places of circulation. Animated videos and other videos to strengthen information. Digital game to test students' understanding.
Development	Making or collecting necessary media	Audio (narrated by the application developer), video (collected from free sources on the internet), animated video (self-made, or collected from free sources on the internet), pictures of various types of drugs (collected from internet), digital game (self-made). Tools for development: Macromedia flash.
	Defining appropriate interaction that must be creative and innovative.	Interaction: students ran the application independently; navigation and exploration were not limited to lesson hours, but depending on students' desire to explore the application.

4.3. Application Development and Data Requirements

Based on the result of analysis of the needs of the learning application presented above, the following application design was created. The data needed include pictures, videos, and animated videos explaining the dangers of drug abuse. These data were saved in XML format, consisting of four data groups: pictures, videos, facts, and messages. Fact data group was used to save information about pictures explaining facts, and Message data group was used as a media facilitating feedback from students.

4.4. Menu Design

This application is designed to be controlled by teachers, acting as administrator. This means that when the application is started, students do not access other applications on the computer. Therefore, before entering the main display, teachers are expected to activate the full-screen feature and the contents. It is from the main screen that students can access subject materials, animated videos, the game, types of drugs, danger of abusing drugs, ways to prevent drug abuse, and other information. Interaction with students is also facilitated by the provision of guestbook feature for students to fill in their messages and comments. The menu design is shown in Figure 2.
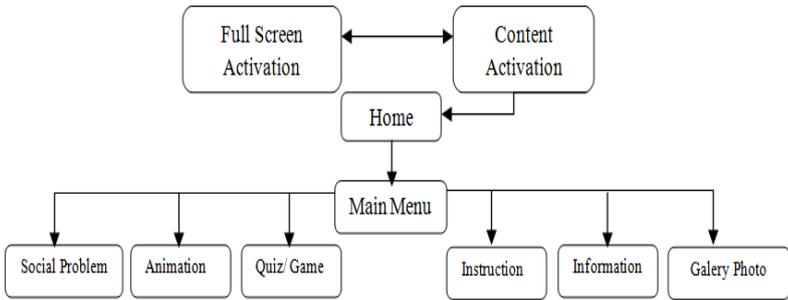
Figure 2: Design of the Interactive Multimedia Application Menu to
Prevent Drug Abuse

4.5. Application Realization

The menu design above was then realized as an application running
in Flash Player 11.2. Figure 3 shows some snippets of the application
while it is running. The main display was designed according to the
Windows 8 interface style, which consists of a group of icons representing
information to be accessed. The design was intentionally chosen by paying
attention to the recently popular trend of the display.

Figure 3: Main Menu Display of the Application

To strengthen information presented, the application is also equipped with animated videos about the dangers of drug abuse. It is expected that this kind of presentation can make more impression and raise awareness of students. Figure 4shows the display.

Figure 4: Display of Animation to Prevent Drug Abuse

The game was realized in simplicity with a simple interface design approach. The game consisted of only three levels, with increased difficulty in each level. Figure 5 show this display.

Figure 5: Display of Games and Tests

5. CONCLUSION AND RECOMMENDATION

It is concluded from the development process of multimedia learning application by using ADDIE approach that ADDIE can be used in developing an interactive multimedia application which can support the learning process. This model provides stages facilitating in specifying target users, compiling materials to be presented, searching necessary supporting sources, and determining presentation approach

used. This ADDIE approach was then used in the trial as an approach to develop interactive learning multimedia application to teach drug abuse prevention for Primary School students. The application was equipped with games to support learning outcomes evaluation process. Results of evaluation on an interactive aspect show that the developed application can be considered as meeting criteria for interactive application, based on the users' perspective.

However, this research has not yet conducted an evaluation of the subject material presented. It is based on the result that further studies are recommended to conduct an evaluation on the subject material, both formative and summative so that the cycle in ADDIE approach can be thoroughly applied, and the desired initial targets and students' response as application users in final stages can be compared.

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