



## **BISINDO Alphabet Visualization in Interactive Media**

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### **ABSTRACT**

Learning technology continues to develop along with the times. In the implementation of daily learning, we often encounter the utilization of technological developments in the world of education, as is often done by teachers or lecturers, namely combining technological tools in learning processes. The development of science and technology has a positive impact with the increasingly open and spread of information and knowledge from and to the whole world penetrating the boundaries of space and time. One of the technological developments in education is interactive media, with the making of this interactive learning media the teaching and learning process becomes effective, interesting and fun for students. The purpose of this research is to produce BISINDO learning media. The benefits of this learning media are to be a solution to the learning process that is effective, interesting and more fun and facilitates the learning process of students.

Keywords: BISINDO; Dale's Cone Experience; Deaf; Distance Learning Media; Sign Language

### **INTRODUCTION**

The public's view of deaf and hard of hearing people is still very minimal. This is due to the difficulty of communication. Those who can hear and use oral language or clear lips and vocabulary that can be understood. For those who are deaf and hard of hearing, they use sign language to communicate with others. The use of sign language is a step they take in order to continue to interact with the general public [1].

Sign language itself is used in everyday life for deaf and hard of hearing people to communicate. One of the difficulties is how deaf people inform the sign language used and can be understood by people who can hear so that deaf people can communicate, get along, make friends, and occur dialog in everyday life [2].

In this modern era, the use of smartphones is widely used to get to know the surrounding environment, learn, communicate with each other, and many more things that can be done on smartphones. People with disabilities (deaf/tunawicara) are also happy to use the technology. However, because they cannot speak and hear, it will cause problems, especially in learning the structure of words or sentences that are often spoken or written by those who can hear or speak.



# BISINDO Alphabet Visualization in Interactive Media

Rizky Alfi Randa, Yeffry Handoko Putra

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Therefore, an interactive learning media was created that can be used by deaf and hard of hearing people.

The learning media is mobile-based with several categories so that the media can be used properly. With this application, the deaf, speech impaired and also including people who can speak and hear normally can use it in learning sign language, so they can communicate better.

## METHOD

The development of Indonesian sign language learning media includes Research and Development (R&D). The design and development of this media uses a 5-stage software model which includes

- Needs Analysis
- Media Design
- Media development
- Testing
- Implementation

## RESULTS AND DISCUSSION

### A. Learning Media

Learning media is a form of the word medium. Medium can be interpreted as an intermediary or an introduction to the occurrence of a communication from the sender to the recipient [3]. Learning media is also a tool, method, and technique used in order to further streamline communication in the education and teaching process at school [4]. Based on this definition, it can be said that the learning process is a communication process. The definition of media in this study is limited to educational media used as a tool or support for learning activities.

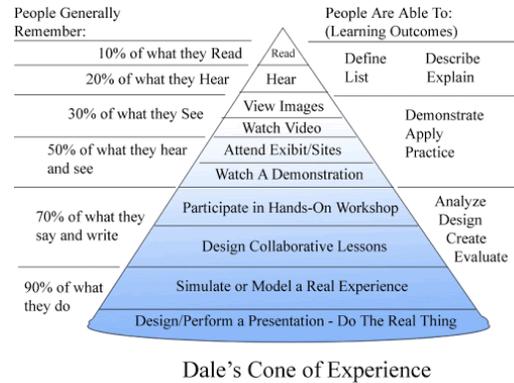
### B. Use of Learning Media

Knowledge and skills, changes in attitudes and behavior can occur due to the interaction between new experiences and experiences that have been experienced before. There are three main levels of learning mode, namely direct experience (enactive), pictorial experience (iconic), and abstract experience (symbolic) [5]. One of the most widely used descriptions as a theoretical basis for the use of media in the teaching and learning process is Dale's Cone of Experience (see Figure 1). The influence of media in learning can be seen from the level of learning experience that will be received by students. Dale describes a cone shape, a person's learning outcomes are obtained starting from direct experience (concrete), the reality that exists in a person's life environment then through artificial objects, to verbal symbols (abstract) [6].



# BISINDO Alphabet Visualization in Interactive Media

Rizky Alfi Randa, Yeffry Handoko Putra



Source: facultyfocus.com [12]

The grouping of various types of media when viewed in terms of technological development by Seels & Glasgow in Arsyad (2005) is divided into two broad categories, namely traditional media choices and cutting-edge technology media choices [9].

## 1. Traditional Media Choice

- 1.1. Projected still visuals: Opaque projection, overhand projection, Slides, Filmstrips
- 1.2. Visuals that are not projected: Pictures, posters, photos, charts, graphs, diagrams, exhibitions, info boards
- 1.3. Audio: Recordings on disk and tape cassette, reel, cartridge
- 1.4. Printed: Textbooks, modules, programmed texts, workbooks, scientific magazines, loose-leaf sheets (hand outs)
- 1.5. Realia: Models, specimens, manipulatives (maps, puppets)

## 2. Cutting-edge technology media choices

- 2.1. Telecommunication-based media: Teleconference, Distance learning
- 2.2. Microprocessor-based media: Computer-assisted instruction, Computer Game, Interactive Video, Compact Video Disc, Intelligence tutor system.

## C. Interactive Multimedia

The meaning of interactive media as a process of empowering students to control the learning environment [7, 8, 10, 11]. In this context, the learning environment in question is learning by using a computer. Interactive classification in the scope of learning multimedia does not lie in the hardware system, but refers to the computer monitor. The quality of student interaction with the computer is largely determined by the sophistication of the computer program. There are three levels of interaction based on the quality of interaction (see Table 1).



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Table 1 Quality of Interactiopn Level

Degree	Function	Transaction
Reactive	Confirmation	Space Bar/Return Key
Proactive	Pacing	Touch Screen Target
Mutual	Navigation	Touch Screen Ray Trace
	Inquiri	Mouse Click
	Elaboration	Mouse Drag
		Barcode
		Keyboard-Key Response
		Keyboard-Contrusction
		Voice Input
		Virtual Reality Interface

## D. BISINDO Alphabet Visualization

In the process of visualizing the Alphabet, the first thing to do is to sketch the hand (see Figure 2 then proceed with digital depiction (see Figure 3) finally applied with a background and added several supporting components such as characters, buttons for navigation, alphabet letters, explanations of how to demonstrate, and so on so that it looks attractive (see Figure 2, 3, and 4).

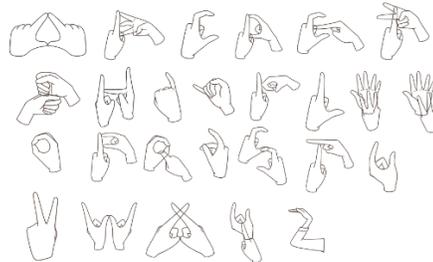


Figure 2 Hand Sketch

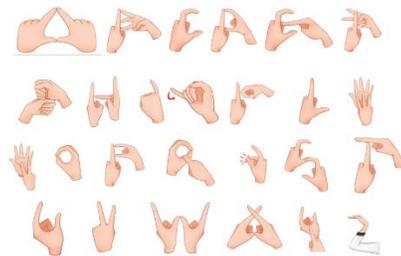


Figure 3 Hand digital depiction



# BISINDO Alphabet Visualization in Interactive Media

Rizky Alfi Randa, Yeffry Handoko Putra



Figure 4 Final of BISINDO

## E. Requirements Analysis

This needs analysis begins with identifying the actors involved in the application, describing the functional needs that will be modeled in the form of use case diagrams and non-functional needs. This needs analysis aims to describe the needs that must be prepared by the system to suit user needs.

## F. Actor Identification

It is a stage to identify the actors who will interact with the application. In this application the user can play a role in displaying table-based cue learning.

Actor	Description
User	Users whether deaf or not with an age range of 6-30 years can use this application.

## G. Functional Requirements Analysis

Consists of functional and non-functional requirements. The list of requirements will specify the functional requirements of users which are indicated by numbering using SRS (Software Requirement Specification) and described using use case diagrams.

The purpose of the non-functional requirements analysis stage is to analyze the needs of users.

Code	Requirement	Use Case
SRS_001	Users can open an explanation of the use of the alphabet in sign language using the Ayo Belajar Bisindo application.	opens an explanation of the use of the alphabet in sign language
SRS_002	Users can open an explanation of the use of numbers in sign language using the Ayo Belajar Bisindo application.	opens an explanation of the use of numbers in sign language
SRS_003	Users can open an explanation of the use of greeting words in sign language using the Ayo Belajar Bisindo application.	opens an explanation of the use of greeting words in sign language



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# BISINDO Alphabet Visualization in Interactive Media

Rizky Alfi Randa, Yeffry Handoko Putra

SRS_004	Users can open an explanation of the use of sentences in sign language using the Ayo Belajar Bisindo application.	opens explanation of sentence usage in sign language
SRS_005	Users can open an explanation of the use of nouns in sign language using the Ayo Belajar Bisindo application.	opens an explanation of the use of nouns in sign language
SRS_006	Users can open an explanation of the use of family calls in sign language using the Ayo Belajar Bisindo application.	opens an explanation of the use of family calls in sign language

Code	Parameter	Description
SKNF_001	Compatibility	Application must be able to run on various Android versions
	Data Storage	Device must have approximately 50MB of memory remaining

## H. Functional Test Analysis

The analysis process aims to get the results and conclusions of the application testing that has been done.

Test Case	Expected Results	Result	Status
View Menu	The application can display the main menu (Learning and Quiz)	Displaying the main menu	Valid
Selecting a Quiz	The application display the Quiz	Displaying the Quiz	Valid
Choose to Study	The application display learning menu	Displaying the learning menu	Valid
Selecting the Alphabet	Display alphabet from A to Z	Displaying alphabet from A to Z	Valid
Selecting a Number	Display numeric	Displaying the numeric	Valid
Choose a Family	The application display family menu	Displaying the family menu	Valid
Choosing the Greeting Word	The application display greeting menu	Displaying the greeting menu	Valid
Choosing the Question Word	The application display question word menu	Displaying the question word menu	Valid
Selecting a Noun	The application display noun menu	Displaying the noun menu	Valid

## CONCLUSION

Based on the analysis of design and implementation, it can be concluded that the interactive learning media application Ayo Belajar Bisindo can run well on Android devices.



# BISINDO Alphabet Visualization in Interactive Media

Rizky Alfi Randa, Yeffry Handoko Putra

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