



# Developing Sign Language Digital Dictionary “Kolak-Indonesian-English” Through Smart Kolak Application as a Media for Learning and Preserving a Natural Sign Language in Bengkala Village

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**Abstract.** Kolok Bengkala language is used by dumb and deaf people in Bengkala to communicate with each other or with normal people in general. Sign language that prioritizes nonverbal aspects will take a long time to learn if using conventional learning methods such as reading books or just looking at explanatory pictures. Kolok learning innovation is needed that can help users to learn kolok sign language easily and effectively. Along with the development of technology, a digital kolok dictionary that can display videos is an effective solution to make learning the kolok sign language easier. Kolok language learners are not only from Bali but are also interested in being studied by tourists/foreigners so that the translation of the kolok sign language into English is also very necessary. Smart kolok application as a provider of information about the kolok village of Bengkala is the right application to be invited to collaborate in presenting this digital dictionary. The development of this digital dictionary uses Research and Development (RnD) research methods with the research steps: 1) Analysis, 2) Design, 3) Development, 4) Implementation, 5) Evaluation. The development of this learning media involves 2 experts as product design validators. The result of this development is a digital dictionary of Kolok-Indonesian-English sign language that can display videos of kolok sign language movements. Tests of digital dictionaries by materials and media experts have shown this dictionary to be of excellent quality. Likewise, the results of user testing of digital dictionaries conducted on 10 students of the kolok sign language show that this dictionary has very good functional quality. Based on the test results, it can be concluded that the developing Kolok-Indonesian-English sign language digital dictionary can be used as a learning media for Kolok sign language.

**Keywords:** Kolok-Indonesian-English · Digital Dictionary · Smart Kolok · Learning

# 1 Introduction

Bengkala Village is one of the villages located in Kubutambahan District, Buleleng Regency, Bali Province. The geographical situation of Bengkala Village is dominated by hilly areas with 1,500 women (50.08%) and 978 families of households. The type has an area of 277 hectares, is located at an altitude of 197 m above sea level, rainfall is  $\pm 200$  mm and has an average air temperature of  $30^{\circ}$ – $32^{\circ}$  Celsius. The population of Bengkala Village in the 2020 census was 2,995 people, consisting of 1,495 men (49.92%), and the jobs that the Bengkala Village community were involved in were very diverse, ranging from farmers (25.48%), laborers farming (12.12%), employees of private companies (9.32%), taking care of the household (9.05%) and other types of work.

Bengkala Village actually has various potentials that can be developed, one of the most prominent of which is the recognition of Bengkala Village as Kolok Village [5]. Kolok literally means dumb and deaf, then Kolok Village means a village where some of the people suffer from hearing impairment (dumb and deaf) [2], or do not have the ability to speak and hear. The population of people with hearing impairments (kolok) in Bengkala Village were 50 people out of 2,276 residents of Bengkala Village [6]. Meanwhile, data on the population of people with hearing impairments (kolok) in Bengkala Village in 2021 were 40 people. This number is relatively high because normally the incidence of congenital (congenital) deaf dumb (kolok) only occurs in one in 10 thousand births [6].

People with normal hearing senses communicate verbally through voice or sound on a regular basis. Meanwhile, kolok people communicate through sign language, which makes sight the most essential sense for acquiring information. Communication between ordinary people and koloks is hampered by this language barrier. Of course, learning spoken language is impossible for koloks. However, normal people can learn the kolok language. Normal and kolok people will be able to communicate through sign language, which can be learnt by anyone. If traditional learning methods such as reading books or simply looking at explanatory visuals are used, sign language that emphasises nonverbal features will take a long time to master. It takes a sign language learning innovation to be able to help users to learn sign language easily. Kolok learning innovation is needed that can help users to learn kolok sign language easily and effectively. Along with the development of technology, a digital kolok dictionary that can display videos is an effective solution to make learning the kolok sign language easier. Kolok language learners are not only from Bali but are also interested in being studied by tourists/foreigners so that the translation of the kolok sign language into English is also very necessary.

Smart kolok application as a provider of information about the kolok village of Bengkala is the right application to be invited to collaborate in presenting this digital dictionary. This application was developed with the main aim of becoming a kolok information center which includes elementary teaching materials, information on creative products of the kolok community, an overview of the kolok community including the activities and history of the kolok village, and information about the arts in the kolok village such as the Jalak Anguci dance, janger kolok, and other dances.

Bengkala Village is often visited by domestic and foreign tourists, and is used as a place of research and service because of its uniqueness. This shows that many people have

been active and interacting with kolok village. Based on the preliminary observations carried out, some of the obstacles faced by people who came to the village of Kolok Bengkulu were the limited communication with the kolok people because they could not use the kolok sign language so they needed someone who could translate the kolok language. However, until now not many people can use the kolok language, so the concern about the extinction of the kolok language is also a threat. So, the innovation of developing Kolok-Indonesian-English sign language digital dictionary through Smart Kolok Application is very necessary for learning and preserving the Kolok language. In developing Kolok-Indonesian-English sign language digital dictionary through Smart Kolok Application it is expected to be able to help people to learn the sign language effectively. So, the purpose of developing this sign language learning dictionary is a useful as a tool/digital media for the learning process of sign language.

The term “media” refers to all tools used to disseminate information [5]. Body language and facial expressions are used in sign language to reflect spoken words. (fuks).

Making video and android-based applications to support the learning of sign language, in several research results has proven to be effective and efficient. Such as Kautsar, I., Borman, R. I., and Sulistyawati, A. [4] who made the product “Sign Language Learning Application for Deaf Persons Based on Android”, Qoyyimah, A. D., and Adi, E. P. [7] with the product “Game Application. Android-Based in Improving the Vocabulary Ability of Deaf Children”, Fauziah, Y., Yuwono, B., Cornelius, D. W. P [3] who made the product “Electronic Dictionary Application of Sign Language for the Deaf in Indonesian Web-Based”, Nuryazid, N., Mulwinda, A. [6] who made the product “Indonesian Sign Language Dictionary Application (Bisindo) by Integrating Android-Based Video Cloud. Some of the results of the research above show that applications made/developed can help in understanding sign language.

## 2 Method

This study conducted as a Research and development (RnD) research. Design and development are well known as a research methods carried out to create a product and test its effectiveness [4]. ADDE (Analysis, Design, Development, and Evaluation) model used as the research procedure in conducting the Research and Development research which consists of Analysis, Design, Development, Implementation, Evaluation to design a learning system.

The types of data in this study are qualitative data and quantitative data. Qualitative data was obtained from the suggestions of media experts and material experts given during consultations and discussions. Then quantitative data were obtained from the validation results of material and media experts. The data collection technique used in this study was in the form of a questionnaire addressed to material experts and media experts in order to obtain feasibility validation results regarding the materials and media used in this digital dictionary media. The questionnaire in this study consisted of several statements related to the material and media that would be developed and used a Likert Scale with a score of (Table 1).

**Table 1.** Likert Scale Categories

Score	Criteria
1	Very Poor
2	Poor
3	Enough
4	Good
5	Very Good

Data analysis in this study used the formula [3]:

$$P = \frac{f}{N} \times 100\%$$

P = Percentage

f = Total score of data collection results

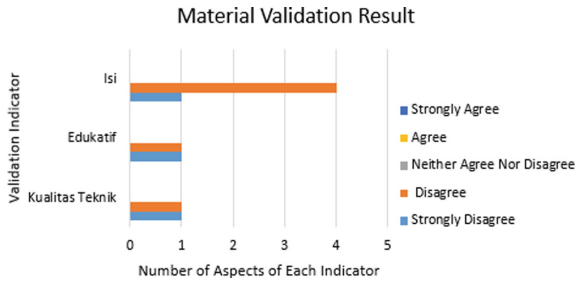
N = Maximum score

The percentage of validation results criteria is divided into five categories. The criteria for “Very Good” ranges from 81%–100%. The criteria for “Good” ranges from 61%–80%. The criteria for “Enough” ranges from 41%–60%. The criteria for “Poor” ranges from 21%–40%. Lastly, the criteria for “Very Poor” ranges from 0%–20% [1].

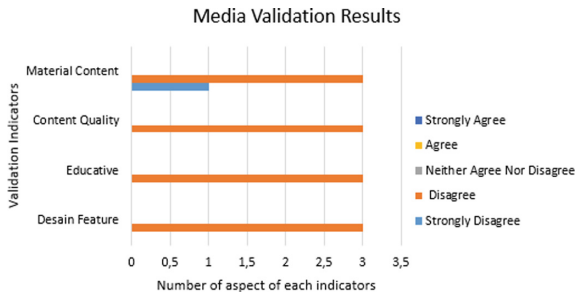
### 3 Results and Discussion

The Kolok – Indonesian - English digital dictionary is the result of an analysis of the needs of kolok language learners and the community in Bengkala village. The needs analysis was obtained by conducting preliminary observations and interviews. Results of preliminary observation provide information that Kolok village is a unique village so that there are tourists who visit there and also many researchers, students, and other institutions that carry out activities and research there. However, with the limited communication with the kolok people, it makes it difficult for the activities to be carried out in the kolok village so that it requires a kolok language translator. Although the kolok language dictionary has been provided in the form of a book, people who visited admitted that they also had difficulty understanding and following the movements in the dictionary. Therefore, the Kolok-Indonesian-English digital dictionary contained in the Smart kolok application features provided the video of how the kolok sign language is demonstrated. Smart Kolok application application was chosen as a place for digital dictionary development because the smart kolok application as a provider of information about the kolok village of Bengkala that already approved by the head of Bengkala Village.

In the design phase, the UI design of this digital dictionary was created with the Figma application. Before the digital dictionary UI design was made in Figma, the researcher made a draft dictionary concept that will be made first. The digital dictionary feature contained in the Smart Kolok application consists of several vocabularies. Each vocabulary contains video and text elements. The video will display the kolok sign language while the text will be showing their translate in Indonesian and English.



**Graph 1.** Material Validation Results



**Graph 2.** Media Validation Results

After finishing the designing UI of this digital dictionary development, the next step was digital dictionary development. In this stage, include some process that require to be done start from recording videos, editing the videos, revising the videos, and the last assessing products by expert judgment. Kolok sign language video made by using a recording of the original Kolok language translator from the village of Bengkulu.

After the Kolok sign language videos and descriptions in Indonesian and English in the dictionary are made, a validation test is carried out to evaluate the quality of the videos in the dictionary and content. The questionnaires were then distributed to material experts, media experts, 10 kolok language learners. The results of the validation tests are displayed on Graph 1 until Graph 2.

The average results of material validation are 93% and included in very good criteria. The graph above shows the number of aspects of the assessment, which are 9 and divided in 3 indicators. 5 items in the content indicator, 2 items in the educative indicator, and 2 items in technical quality indicators. The validation results show 6 out of 9 aspects get scores Strongly Agree and the other 3 get scores Agree. Validator strongly agree that the Kolok-Indonesia-English digital dictionary developed in accordance with the needs of kolok language learners and can participate in multiplying information in the preservation of the kolok language, as well as the material in the digital dictionary is very compatible with the kolok dictionary which had previously been compiled in book form. Suggestions and comments from material experts, namely this digital dictionary product very useful for socializing and educating all parties so that they can understand and then implement the kolok language. In the future, it is hoped that the vocabulary in

the dictionary will be expanded again to broaden knowledge about the kolok language itself.

The average result of media validation is 81% and is included in the very good criteria. The graph above shows the number of aspects of the assessment, which are 13 and divided in 4 indicators. 4 items in the material content indicator, 3 items in the content indicator quality, 3 items in the educative indicator, and 3 items in the design feature indicator. Results The validation shows 12 out of 13 aspects get an S (Agree) and 1 other get the SS score (Strongly Agree). The validator agrees that the developed Kolok-Indonesia-English digital dictionary is effective and efficient to use because it is presented directly using motion with video so that easy to understand. Suggestions and responses from media experts, namely the duration of the video is too short, maybe in the future it can be given repetition so that it can be absorbed and understood well by kolok language learners.

## 4 Conclusion

Based on the research conducted, the development of the kolok-indonesia-english digital dictionary was carried out in the Smart Kolok application. In testing quality educational video media, assessment sheets in the form of questionnaires are distributed to the material experts, media experts, and 10 kolok language learners. From the data results analysis, it can be concluded that this digital dictionary is suitable for use in learning the kolok language and preserving the kolok language.

Based on the validation results from material experts and media experts, it can be concluded that:

1. The Kolok-Indonesian-English Digital Dictionary in the Smart Kolok application is categorized in very good criteria with a percentage material validation is 93% and media validation percentage is 81% with some revisions.
2. The use of the Kolok-Indonesian-English Digital Dictionary can be used by learners of the Kolok language.

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