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Kolok.id: Digital Learning Media with Game and Dictionary App to Improve Deaf Students' Learning Performance

Ni Putu Ayu Pirdayanti[1*], Ni Ketut Anggriani[2], Gusti Aditya Trisna Murti[3], I Ketut Andika Pradnyana[4], I Wayan Pardi[5]
1 Pendidikan Bahasa Inggris, Universitas Pendidikan Ganesha, Singaraja, Indonesia
2 Pendidikan Sejarah, Universitas Pendidikan Ganesha, Singaraja, Indonesia
3 Pendidikan Teknik Informatika, Universitas Pendidikan Ganesha, Singaraja, Indonesia
4 Pendidikan Teknik Informatika, Universitas Pendidikan Ganesha, Singaraja, Indonesia
5 Pendidikan Sejarah, Universitas Pendidikan Ganesha, Singaraja, Indonesia
E-mail: ayu.pirdayanti33@email.com, niketut1504anggriani@gmail.com, gustiaditya123@gmail.com, andhikapradnyana14@gmail.com, wayan.pardi@undiksha.ac.id

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Corresponding author:
ayu.pirdayanti33@email.com

ABSTRACT

SD Negeri 2 Bengkala is an inclusive school that aims to improve the quality of education for kolok students. Kolok means dumb and deaf. Problems faced by Kolok students in learning activities namely 1) as they have physical limitations to be unable to speak and hear something, this situation hardly affects their learning process, 2) teachers have not used creative and innovative learning media, 3) Kolok students find difficulties to understand abstract material, moreover when they have nobody as their assistant (kolok translator) to help them understand their lesson. Knowing this situation, Kolok.id is developed to overcome problems encountered by most of kolok students. Kolok.id is an application developed to help kolok students receive lesson easier and facilitate their communication needs. The main features contained in the kolok.id application includes basic competencies and indicators, teaching materials, crossword puzzle games, quizzes, kolok dictionaries, and guide book. Kolok.id application is also relevant to use during the Covid19 pandemic to support Kolok students learning from home. In addition, this application can also be used anytime and anywhere. The development of Kolok.id application uses the method of Multimedia Development Life Cycle (MDLC) which consists of 6 development stages, namely Concept, Design, Material Collecting, Assembly, Testing, and Distribution. Kolok.id application has gone through the testing stages of beta and alpha with very good results.

1. INTRODUCTION

Bengkala Village is one of the villages located in Kubutambahan District, Buleleng Regency, Bali Province. Bengkala village is known as kolok village. (Widiastini, et al., 2020: 204; Andika, 2018, p. 2). Kolok literally means dumb and deaf, then Kolok Village means a village where some of the people suffer from deafness (dumb and deaf) (Aryantika and Darmawiguna, 2015, p. 2), or do not have the ability to speak and hear. Widnyana, et al. (2017, p. 145) reported that in 2017 the population of people with hearing impairments (*kolok*) in Bengkala Village was 50 people out of 2,276 residents of Bengkala Village. 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 (Widnyana, et al., 2017, p. 145).

SD Negeri 2 Bengkala organizes a special inclusive school for people with deaf and dumb disabilities. In terms of curriculum, this school is no different from other schools, only in teaching and learning activities and communication, *kolok* students use special sign language or *kolok* language. The limitations of the kolok community have a serious domino effect on *kolok* students in the teaching and learning process. Due to the lack of an education system, the *kolok* community is unable to improve their quality of life because some people can only work odd jobs and the most dominant are grave diggers. This of course has an impact on the economic level of the *kolok* community. So that until now the *kolok* people can be categorized as poor people because they cannot get good jobs.

The Covid-19 pandemic that hit Indonesia in early 2020 had a serious impact on the continuity of the *kolok* student education process. The Covid-19 pandemic that hit Indonesia in early 2020 had a serious impact on the sustainability of the *kolok* student education process. The teaching and learning process of *kolok* students also encountered many obstacles because *kolok* students only studied independently from home without assistance from the teacher. Their parents also have limitations when directing *kolok* students to study from home because of the limited education of their parents. Moreover, students with limitations such as *kolok* students have an unstable nature so that it affects the desire and consistency in learning. This is in accordance with the explanation of Ketut Kanta, a teacher at the Inclusive School, that teaching *kolok* students requires a very deep approach to persuade them to learn.

In line with the various problems above, various solutions are needed that are able to solve these problems and help *kolok* students in Bengkala Village. During the current pandemic, the use of technology is an alternative way to overcome problems that make it impossible to hold meetings in person or some activities are carried out online. In Bengkala Village which can be said to be a village far from the city, it is also difficult to access technology, let alone to create the technology itself. Technology development in a simple application that can facilitate students to learn, at least very helpful in general aspects needed by *kolok* students.

Based on the limitations possessed by *kolok* students, several problems arise. Moreover, coupled with the outbreak of the COVID-19 pandemic which caused more and more problems and had an impact on *kolok* students. Limited education is the forerunner of the problems that exist in *Kolok* village. Learning for *kolok* students is a little simpler than normal students, but it will still be difficult because of the limitations of *kolok* students. The problems faced by *kolok* students in learning activities, namely the physical limitations of *kolok* students who cannot speak and hear have an impact on the difficulty of the learning process, teachers have not used creative and innovative learning media so students feel bored quickly, it is difficult for *kolok* students to understand learning material which is abstract and if by chance the special companion of *kolok* students (*kolok* language translator) is unable to attend, the *kolok* students will have difficulty in receiving lessons. There is no special curriculum or lesson plans provided for *kolok* students, so teachers only use learning methods like teaching normal children. And the next problem is the difficulty of growing a sense of at home or feeling at home in *kolok* students when studying, *kolok* students are the type of picky when taught, not infrequently some do not match the teacher while there are two teachers in inclusive schools, so teachers are required to be able to win the hearts of students *kolok*, even by giving money or food. Moreover, coupled with the COVID-19 pandemic, *kolok* students only study independently without being accompanied by a teacher.

Some previous research explains that by using digital learning media can help the teacher deliver the material and can improve students' understanding of the materials. This is stated in the research from Harjono, Bambang, Priyanto, & Pranowo (2023) the use of digital media applications is very helpful and makes it easier for teachers to deliver learning material. This is supported by other research that discovered students find the use of digital media applications to deliver content to be highly enjoyable, which can lead to an increase in their active engagement with the learning process (Aeni & Yusupa, 2018)

Based on this, this research aims to develop the kolok.id application as a simple learning application. Kolok.id application seeks to optimize education for the *kolok* community through simple learning features. In the kolok.id application there are educational features in the form of learning materials also packaged with interesting videos or quizzes that can foster interest in learning for *kolok* students who have difficulties in receiving learning. Other than that, Kolok.id also provide *kolok* dictionary. This application packaged to make *kolok* more attractive to students in the learning process because they can enjoy videos that are not boring while studying.

The other study also develops learning applications for children with disabilities including research from Karanfiller, et al. (2017) that design and develop software for children who need special education, teaching basic concepts via mobile devices and teaching aids. The designed software is aimed at being a teaching-learning environment. The usability of the developed application has been tested. The test phase was completed with the contributions of real students. Current test results show that the developed application can be used by students who need special education. The second research came from Azmi (2017) who developed application of Android-based "English for Disability" application in English subjects for class VII SMPLB YKAB Surakarta students with basic grammar/grammar competence and English pronunciation for blind children. This application already helps children in well (Azmi, 2017)

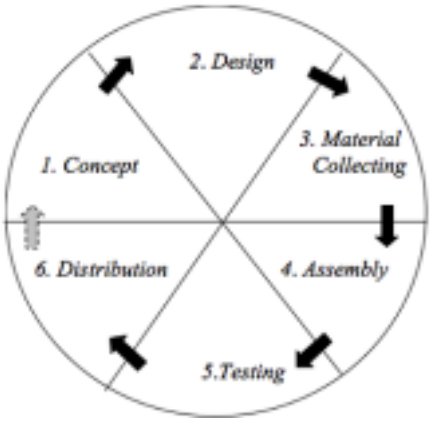
In developing the application for learning media, there are several characteristics or requirements. England, et al. (2002) stated in (Wahrinia & Peng, 2023) said that "Interactive Media is the integration of digital media including a combination of electronic text, graphics, moving images, and sound into a structured digital environment that can make people interact with data for the right purpose". It means that the development of digital learning media must include those characteristics to make it a good learning media.

2. METHOD

Research and Development Methods in this study used the Multimedia Development Life Cycle (MDLC) Luther Sutopo version. Multimedia Development Life Cycle is a research method that can be used in the development of interactive learning media, however, the stage concept should be the first thing to do (Binanto, 2010). This development consists of six stages, namely, concept, design, collecting material, assembly, testing and distribution.

Figure 1

Multimedia Development Life Cycle Diagram (Binanto, 2010)



a. Concept

The concept stage is the stage to determine the purpose, type, concept of media, learning materials, and user targets from making multimedia applications. In general, the process carried out at the concept stage is to determine the objectives of the learning media, determine the concept of learning material, and determine the concept of the content of the learning media. In addition, determining the concept of gamification analysis refers to the Octalysis Framework Development & Accomplishment which consists of several gamification elements.

b. Design

In the design stage researchers made a detailed specification of the project architecture, appearance and material needs of the project, as well as style. This stage uses storyboards to describe a series of stories or descriptions of each scene so that it can be understood by the user, by listing all multimedia objects and links to scenes other. This media design helps the teacher in explaining the learning material.

c. Material Collecting

Material Collecting is the stage of collecting materials that needed. These materials include images, photos, animations, videos, audio, and text, both ready-made and those that still need to be modified according to existing needs.

d. Assembly

The assembly stage is the stage of making the entire multimedia material. The making stage is the stage where all multimedia objects such as text, images, audio, video and other materials that have been previously collected are made into a learning media that is arranged in a unified whole in accordance with the storyboard that has been made previously. This learning media program uses a combination of text, images, animation, video, and music with interactive navigation buttons to make the program more interactive and interesting. The creation of this learning media begins with creating page designs in Adobe Flash CS6 and supporting images in Adobe Photoshop. After all the designs are complete, the next step is to enter an action script so that the learning media can run as expected.

e. Testing

Tests are carried out to ensure that the results of making interactive learning media are in accordance with the plan. The testing stage is carried out after completing the assembly stage by running the application / program and seeing whether there are errors or not. By using the Gregory scale calculation (Candasa, 2010) which is shown in table 1. For individual, small group and field validation tests using the linkert scale calculation shown in Table 1.

Table 1
Level achievement (Candiasa, 2010)

Level achievement	Coalification
0.8 – 1,00	Very high
0.6 – 0.79	High
0.40 – 0.59	Medium
0.20 – 0.39	Low validity
0.00 – 0.19	Very Low validity

Validation of student responses using the linkert scale calculation of student response criteria is shown in Table 2.

Table 2
Students respons criteria (Candiasa, 2010)

Level Achievement	Interpretation
0%	Very poor
10 – 33%	Less
44% – 66%	Enough
67% – 99%	Agree
100%	Strongly agree

f. Distribution

The last stage of developing interactive learning media is media distribution. At this stage, the application will be stored in a storage medium such as a compact disk.

3. RESULTS AND DISCUSSION

3.1 Results

The development of application refers to the basic competence and syllabus used at SD Negeri 2 Bengkala for kolok students. The development of digital learning media in its manufacture uses Adobe Flash CS6 Action Script 3.0 Software to adapt to the storyboard that has been made previously. The manufacturing process is carried out in stages and to produce appropriate learning media. These digital learning media consist of basic competencies and indicators, materials, games, quizzes, guidelines, and developer profiles. This application program uses a combination of text, images, animation, and music with interactive navigation buttons to make the program more interactive and interesting.

The first page is the page that will appear when the learning media is running. The view begins with text and image animation, then will appear the title page and the login button. The login button serves to go to the main page of learning media. On the title page, there are animations of students and teachers showing the characteristics of *kolok* disability students. The title page display can be seen in Figure 2.

Figure 2
Cover of Kolok.id

On the main page of application, there is a menu of Basic Competencies and indicators, materials, games, quizzes, guides, dictionary and profiles. In the header, the title of the learning media is listed. In the upper right corner, there is an exit button to close or end the media, volume buttons to turn off or turn on the back sound. In this display, there are also animated related to education tools so that *kolok* students feel happy in participating in learning. The main page of application can be seen in Figure 3.

Figure 3
The Main Page of Kolok.id

The material menu consists of two main topics: Pancasila and basic math. Each material is shown in an attractive and interesting, collaborated with animated video and uses illustrations of objects around. After the learning session, students can play educational games or answer learning quizzes. The first page of the quiz menu consists of guessing pictures, quizzes, and crossword puzzle games. The picture guessing quiz and the quiz quizzes contain ten questions each. If the user's answer is right or wrong, a right or wrong description notification is displayed with a happy or sad animation. At the end of the test, points and badges or digital badges will appear. There is also a retry button on this page to get back to working on quiz questions and games. The following are pictures of learning media materials, quizzes, and games.

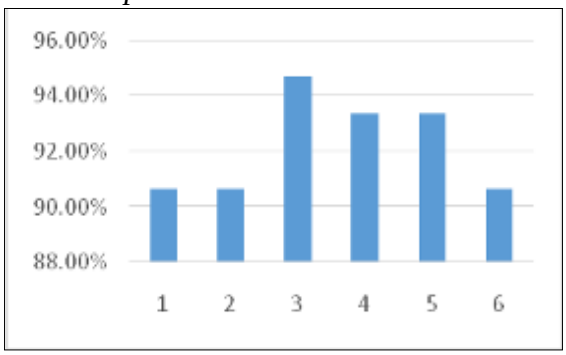
Figure 4
Games features

The learning media that has been developed is validated to determine the appropriateness of Kolok.id. The results of the validation carried out by material, and media experts were 1.00 with the "Very High" criteria on the Gregory scale. Based on the results of the validation carried out by material experts and media experts, it concluded that the average product assessment in terms of material and media was very feasible to use. With the results of this calculation, it can be said that the Kolok.id is "Valid" and is suitable for use in learning. In the validation of material and media experts, there are several indicators and assessment criteria assessed by material experts, namely relevance, accuracy, systematics, and suitability of material presented with the characteristics of *kolok* students. Meanwhile, media experts assessed the indicators, and assessment criteria are design, text/typography, images, animations, users/users, layout, audio, video, navigation, and interactive links. In general, it can be concluded that Kolok.id with the gamification concept is very feasible and suitable with the characteristics of *kolok* students.

After testing the appropriateness of learning media by experts, the student's response to the Kolok.id is tested. The subjects of the student response test to the Kolok.id were *kolok* students at SD Negeri 2 Bengkala. Due to the COVID-19 pandemic, the student response test was limited to 6 students by displaying Kolok.id to students individually in each student's home. Based on the results of the student response test, the average result was 92.2%. The results of the student response test can be seen in Figure 4.

Figure 5

Student Response Test Results Grapic



In conclusion, the Kolok.id have successfully been a very good application for digital learning media in supporting the *kolok* students' learning process.

3.2. Discussion

The research results show that the Kolok.id media meets the needs of teachers and students to be able to explore, identify and understand learning easily and with pleasure. This means that the application, after going through the development and validation procedures of material and media experts, can be used as a reliable learning tool to support the achievement of basic competency for kolok students learning process. Apart from that, the use of learning media applications developed in this research makes it easier for kolok students to understand the material. This finding is in line with previous research findings which show that the suitability and accuracy of learning media can make it easier for students to understand the information and messages of learning materials according to learning objectives (Udayani, Wibawa, & & Rati, 2022) In line with that, the systematic view of learning material, attractive illustrations and button, and integration with interactive game also make it easier for students to understand and remember the material. This finding is also in line with research results which show that the use of technology-based learning media can facilitate teaching and learning activities more effectively and interestingly (Humairah & Lhutfia, 2023)

This research and development, which is in study developed digital learning media with a game and dictionary app named Kolok.id to improve deaf students' learning performance. It reviews how to develop the application including a simple learning application using simple features to optimize education for the *Kolok* community through simple learning features. In the kolok.id application there are educational features in the form of learning materials also packaged with interesting videos or quizzes that can foster interest in learning for *kolok* students who have difficulties in receiving learning. Other than that, Kolok.id also providing *kolok* dictionary by using text and picture. This application packaged to make *kolok* more attractive to students in the learning process because they can enjoy videos that are not boring while studying. The other study has designed and developed software for children who need special education, teaching basic concepts via mobile devices and teaching aids but without including the dictionary for the special language and attractive educative game. This application supports the learning administration of the school because it refers to the basic competence and syllabus used at SD Negeri 2 Bengkala for Kolok students.

We found that this development of digital learning media consists of basic competencies and indicators, materials, games, quizzes, guidelines, and developer profile features. This application program uses a combination of text, images, animation, and music with interactive navigation buttons to make the program more interactive and interesting so that the students can improve their interest in learning. This is in line with research that states "interactive learning media can attract students' attention and interest" (Harjono, Bambang, Priyanto, & Pranowo, 2023). Besides also has met the criteria as good learning media as stated by England, et al. (2002) stated in (Wahrinia & Peng, 2023) said that "Interactive Media is the integration of digital media including a combination of electronic text, graphics, moving images, and sound into a structured digital environment that can make people interact with data for the right purpose".

The results of the validation of this media carried out by material, and media experts were 1.00 with the "Very High" criteria on the Gregory scale. Based on the results of the validation carried out by material experts and media experts, it concluded that the average product assessment in terms of material and media was very feasible to use. With the results of this calculation, it can be said that the Kolok.id is "Valid" and is suitable for use in learning. After testing the appropriateness of learning media by experts, the student's response to the Kolok.id is tested. The subjects of the student response test to the Kolok.id were *kolok* students at SD Negeri 2 Bengkala. Based on the results of the student response test, the average result was 92.2%. In conclusion, the Kolok.id have successfully been a very good application for digital learning media in supporting the *Kolok* students' learning process.

4. CONCLUSION AND SUGGESTION

The design of developing Kolok.id uses the Multimedia Development Life Cycle method which consists of six stages, namely 1. Concept; 2. Design; 3. Collecting Materials; 4. Assembly; 5. Testing; 6. Distribution. The average student response to the development of Kolok.id for students with mental retardation is 92.2%. The development of Kolok.id for students with mental retardation for *kolok* students at SD Negeri 2 Bengkala is able to become a learning resource for students during the covid-19 pandemic. Learning media is used as a student learning guide, so that it can increase concentration and focus on children and help students' learning processes at school. Based on the classification of *kolok* students, Kolok.id was developed according to the characteristics of *kolok* students.

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