

Developing Android-based Disabled Data Information System to List Students with Disabilities (SIDABEL)

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ABSTRACT

Manually registering the disabled population in riverbank areas is time-consuming and error-prone. This research aimed to develop an Android-based application for efficient and effective data collection of the disabled population. Using the ADDIE design within the Research and Development (R&D) framework, participants included six teachers from Paramita Graha B/C Special School, ten teachers from Public Special School 3 Banjarmasin, twelve teachers from Harapan Bunda Special School, and ten Banua Anyar sub-district officers. Data collection involved interviews, questionnaires, and documentation, analyzed through both quantitative and qualitative methods. The study identified the needs of teachers and sub-district officers, guiding the development of the Disabled Data Information System (SIDABEL) application. The application's feasibility was validated with average scores of 3.71 from material experts and 3.63 from media experts, indicating it was appropriate with revisions. Teacher assessments rated the application 3.81, 3.94, and 3.63 from Paramita Graha, Public Special School 3 Banjarmasin, and Harapan Bunda, respectively, categorizing it as good with some suggestions for improvement. After revisions, sub-district officers tested the application, resulting in a final score of 4.55 in the very good category. The SIDABEL application addresses inefficiencies and errors in manual data collection, leading to high user satisfaction and effectiveness in its final iteration. Further research should explore broader implementations and continuous improvements. The Android-based SIDABEL application significantly enhances the efficiency and accuracy of data collection for the disabled population in riverbank areas.

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1. INTRODUCTION

Fujiyanti dan Sukadi (2015) explained that with the development of science and technology and the entry of the era of globalization, changes in the field of communication are unavoidable. The human need for communication is more booming and more expensive, not limited to one area only. Many choices of communication facilities are offered, giving flexibility for the community to choose the type of communication that suits their needs. Turban, McLean, & Wetherbe define an information system as an information system that has the function of collecting, processing, storing, analyzing, and disseminating information for specific purposes (Nursari & Immanuel, 2017). Information systems are tools that can be used in present information effectively and usefully for recipients. The aim is to provide information needed in the planning, organizing, operational, and decision making processes (Sutiyono & Santi, 2020). Information systems function for assist planning, control, and decision making by providing routine summaries and specific reports (Suprihadi, Hudiono, & Wijaya, 2013). Information systems are including in one of sub-systems that exist in the organization in information management. At this time, information systems are used by almost all human resources in the organization, so their role is inseparable from the operations and life of the organization (Swastika, 2016). Therefore, an information system is needed to access population data so that it can be used to record population records and simplify the population data collection process (Sudipa & Lestari, 2019). I Putu Agus Eka Pratama stated that an information system is part of four main parts. These four main parts include software, hardware, infrastructure, and trained Human Resources (HR). These are interrelated to create a system. It can process data into useful information (Harfizar, Yuliana, & Muh Afiffudin, 2017).

It is expected that an information system can overcome population problems, namely issues regarding population quantity (amount), population quality, population mobility, and available data sources (Falikhah, 2013). The residents here deal with people with disabilities. The obstacles experienced so far in collecting data on people with disabilities are differences in perceptions between teachers and parents regarding children's conditions, difficulties in collecting data on children from parents, teachers who do not have special education qualifications and have difficult identifying people with disabilities correctly, and sub-district officers who carry out data collection. Handling people with disabilities takes a relatively long time. There is the possibility of errors in collecting data on types of people with disabilities.

Various studies on digital-based population registration have been carried out, including research carried out by Sopiandi (2020) stating that a web-based poor population of data collection information system will make it easier for villages to enter data on poor people. This web-based poor population of data collection information system can record poor people and validate data of poor population carried out by the admin. The results of research by Dikana, Utami, and Saputera (2022) show that the web-based system information of population data collection developed uses a waterfall model with 13 menus that has been tested for system feasibility by users, namely the office administration team, with the results showing that the system is in accordance with the needs of village office of population data administration services. It is in line with the research of Eprilio, Lestari, and Megawati (2023) that data collection activities are carried out using the problem identification stage method, followed by the development stage of implementing a public administration system for people with disabilities, and the last, assistance from village officials. Currently, the area has a Disabled Population Management System application. Besides that, village officials are quite capable of managing the application. Another finding in Fajarianto & Wahyuni's research (2016) is that errors often occur in the data collection process and it is a lack of availability of officers to conduct surveys on poor communities. The lack of adequate facilities in processing data on poor communities results in ineffectiveness and inefficiency in the data processing process because of systems that do not yet fully use application programs so that further development regarding

applications that can access by users anywhere is also needed and is supported by analysis of the type and extent of special needs a person has based on Android.

Based on previous researches, the development of technology for the purposes of identifying and collecting data on people with disabilities is still rarely discussed and developed. Therefore, the technology developed in this research is an Android-based disabled population data collection application. The Android-based disabled population data collection application is an application used to make it easier for the public or related agencies who want to identify and collect data on disabled people more quickly and effectively than going directly into the field that takes longer.

2. METHOD

The research held on six teachers at Paramita Graha B/C Special School, ten teachers at Public Special School 3 Banjarmasin, twelve teachers at Harapan Bunda Special School, and ten officers at Banua Anyar sub-district. The research method used the Research and Development method. Sugiyono (2016) defines that Research and Development method or development research is a research method used to produce specific product, and test the effectiveness of these products. It is adapted from the ADDIE development model developed by Dick and Carry for designing learning media. It consists five stages, like: analysis, design, development, implementation and evaluation (Setiadi, Yuliatmojo, & Nurhidayat, 2018). It explains in detail in chart 1 below.

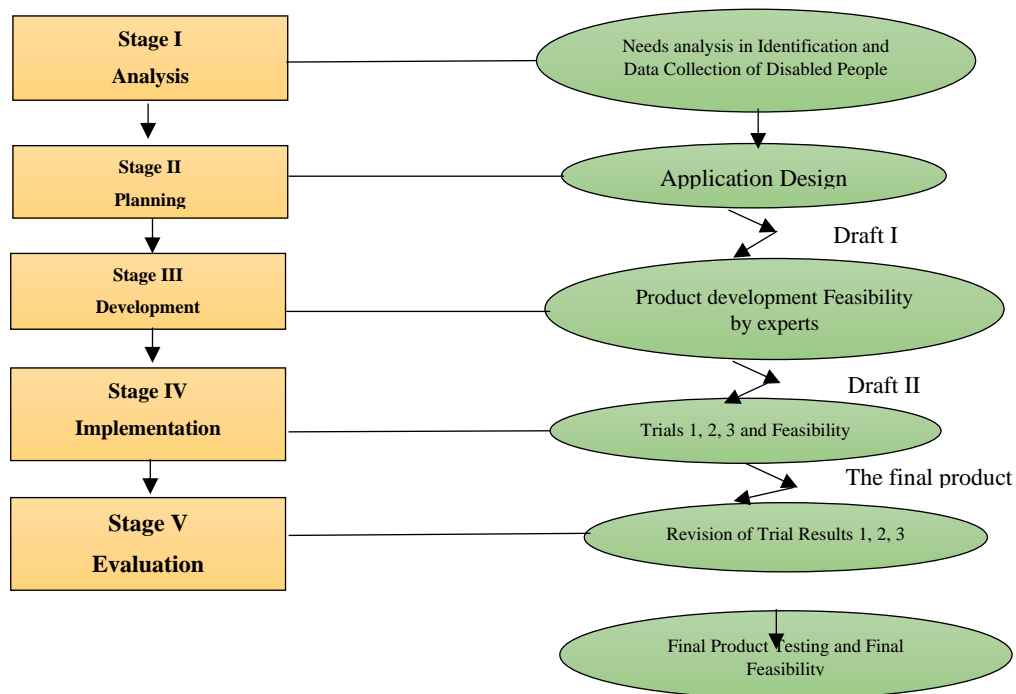


Figure 1. ADDIE Model Design

3. FINDINGS AND DISCUSSION

3.1 Findings

The preliminary studies related to the development of the SIDABEL (Disabled Data Information System) application have been carried out previously by researchers. The researchers conducted this preliminary study at Special School B/C Paramita Graha, Public Special School 3 Banjarmasin, Special

School Harapan Bunda and Banua Anyar Village. After carrying out this preliminary study, there were the obstacles experienced by teachers and sub-district officers in carrying out identification and data collection activities for people with disabilities so far. The researchers then created and developed an application that can be used to facilitate identification and data collection activities for people with disabilities in riverbank areas. The Researchers used the ADDIE research development model in developing this application, with five stages which include Analysis, Design, Development, Implementation, and Evaluation.

3.1.1 Analysis Stage

First of all, the stage carried out was the analysis stage. The purpose of implementing this stage was to determine the needs of the surrounding environment in carrying out identification and data collection activities for people with disabilities. This stage was carried out by distributing questionnaires to Banua Anyar sub-district officers and teachers at several special schools, namely: Special School B/C Paramita Graha, Public Special School 3 Banjarmasin and Special School Harapan Bunda. Based on the results of filling out the questionnaire, it is known that what teachers and sub-district officers need in carrying out identification and data collection activities for people with disabilities is technology that contains an identification instrument for people with disabilities and a database to store data on people with disabilities who have filled out the instrument. This need arises because manual implementation takes a long time, there is a lack of understanding by teachers and sub-district officers regarding how to identify and collect data on people with disabilities, and there is no special technology available that makes implementation easier. In this research the technology will be developed in the form of an application. Through this application, teachers, sub-district officials or the wider community can identify and collect data on people with disabilities, starting from filling in biodata on people with disabilities to filling out statements by choosing the answer "Yes" or "No" regarding the characteristics of people with disabilities by adjusting the child's condition. After completing the filling, a statement will appear regarding whether you are identified or not identified as a person with a disability, directly including the specific types of obstacles experienced.

3.1.2 Design Stage

Based on the results of the analysis obtained in a preliminary study conducted by researchers, it is known that teachers and sub-district officers experience several obstacles in carrying out identification and data collection activities for people with disabilities. This is a consideration for researchers to create and develop an application that can help teachers, sub-district officers and the wider community in carrying out activities for identifying and collecting data on people with disabilities. This application is called the Disability Data Information System (SIDABEL) application.

The Disabled Data Information System (SIDABEL) application contains a login menu in the form of e-mail and password input, as well as a button to direct to the instructions page and information related to the application designer. Then, on the next page, data on disabled people is input in the form of biodata and location of disabled people, as well as initial estimates of obstacles faced by disabled people which will be used and stored on the server as material for collecting data.

Next, the test will be conducted using the instruments in the SIDABEL application. The next page contains input data on who is doing the inputting so that the inputted data can be validated by storing the data on the server and will be accessed when needed. This is for the purposes of validating the data provided in checking the type of disability that is carried out and filled in in the application system.

Another page contains a choice of types of disability tests that can be carried out in the application. It will identify the type of disability experienced by students who have been input into the application and includes 10 types of tests for people with disabilities. In each type of test, there are several questions and levels. This is used to analyze the type and severity of disability you have. The selection of the type of test can be made based on the initial guess that has been input and if a conclusion is not obtained that is in

accordance with the initial guess then another test can be carried out. This application can analyze the special needs of the students or users being tested. All data entered will be recorded on the server and can be used as material in collecting data on people with disabilities.

The question display on the test contains several questions with the answer options "yes" and "no" which will be chosen by the filler based on the condition being checked to find out the criteria for disability, where the data will be translated into the conclusion display to find out whether there are symptoms and the level of disability that is suspected. If people with disabilities are not identified, further tests will be carried out with lighter criteria for people with disabilities so that appropriate conclusions are obtained. The conclusions obtained will be stored on the server so that people with disabilities can access and collect data more easily and appropriate interventions can be carried out from the data. Apart from that, referring to this data, the distribution of disabled people in a region can be obtained. The following is a visualization of the SIDABEL application.



Figure 1. Opening page display



Figure 2. Login page display



Figure 3. Display of the Instructions for Use page



Figure 4. Application Development Team View

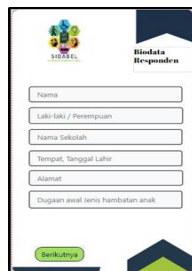


Figure 5. Respondent's Biodata



Figure 6. Data Collection Officer Biodata Display



Figure 7. Identification Menu Display



Figure 8. Identification Menu Fill Display



Figure 9. Display of Identification Results



Figure 10. Summary of Identification Results

3.1.3 Development Stage

The development stage is carried out by handing over the SIDABEL application design to partners to be created. Once completed, the SIDABEL application is validated by material experts and media experts. The results of the material expert assessment of the SIDABEL application obtained an average score of 3.71 and was declared suitable for testing with revisions according to suggestions. The suggestions given by material experts are writing errors in the application content need to be corrected.

Meanwhile, the results of the assessment from media experts obtained an average score of 3.63 and were declared suitable for testing with revisions according to suggestions. The suggestions given by media experts are: overcoming bugs that occur when accessing the summary of identification results. The bug that occurs is that the identification results column only appears 0, when clicked once on the summary menu. So you need to click the back button first and click the summary menu again so that the identification results column can be filled in as unidentified/identified.

3.1.4 Implementation Stage

The implementation phase was marked by the trial of the SIDABEL application on 6 Paramita Graha B/C Special School teachers, 10 teachers of Public Special School 3 Banjarmasin, and 12 Harapan Bunda Special School teachers. The first step, the researchers introduced the SIDABEL application. This application introduction stage was used by researchers to explain the purpose of creating the SIDABEL application and how to use the SIDABEL application. Next, teachers were asked to provide an feasibility of the SIDABEL application.

Table 1. Teacher Assessment Results of the SIDABEL Application

Subject	Average Score for Each Aspect		Average Score for Both Aspects
	Application	Content	
	Meaningfulness	Presentation	
Teacher of Paramita Graha B/C Special School	3,82	3,79	3,81
Teacher of SLB Public Special School 3 Banjarmasin	3,93	3,94	3,94
Teacher of Special School Harapan Bunda	3,68	3,57	3,63

Based on the table above, it is known that the teacher feasibility results of Special School B/C Paramita Graha, Public Special School 3 Banjarmasin, and Special School Harapan Bunda regarding the SIDABEL application were in the good category. After conducting trials on the three SLBs, the researchers obtained the following input from the teachers:

- The initial display when opening the application was a splash screen. The splash screen duration of 10 seconds was too long. It was best to make it less than 10 seconds;
- The appearance of the application was made more attractive;
- There were still sections of written words/sentences that were quite long and cut off and cannot be scrolled down to read more fully. Therefore, it needed to be repaired;
- It was best if the SIDABEL application could be accessed via Playstore;
- The SIDABEL application logo was too small and needed to be enlarged;

- f) The final identification results can be downloaded in the form of soft files such as PDFs, Microsoft Word, or Microsoft Excel files.

3.1.5 Evaluation Stage

Based on the results of trials at Special School B/C Paramita Graha, Public Special School 3 Banjarmasin and Special School Harapan Bunda, the form of follow-up carried out by researchers and partners regarding the SIDABEL application was as follows:

- a) The appearance design was made more modern and neater;
- b) The front display was given a splash screen time of 5 seconds;
- c) Application related explanations were made separate from the front logo and could be swiped and skipped by pressing the continue button;
- d) The login page was created so that data could be connected to the account used and could be accessed at a later date;
- e) The application maker or development team info page was placed in the profile menu;
- f) The conclusion page could be downloaded and the data has been stored in the database;
- g) A history list of tests that have been carried out has been provided;
- h) Inputting the date of birth was made easier with the calendar feature;
- i) Information on the respondent's initial suspicion has been given options according to the identification carried out;
- j) You will be notified whether you are sure about the entries made after completing the identification test before proceeding with the identification results.

The visualization of the SIDABEL application after revision can be seen below.



Figure 11. Splash Page Display



Figure 12. Intro Screen Page Display

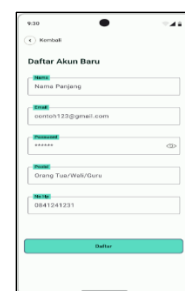


Figure 13. Register Screen Display



Figure 14. Login Page Display



Figure 15. Home page display

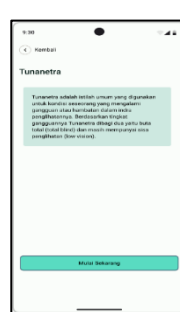


Figure 16. Category Details Display

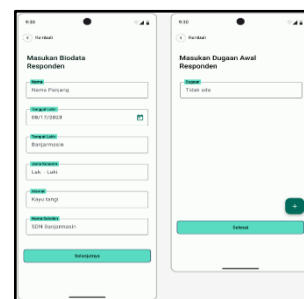


Figure 17. Respondent Biodata Page Display

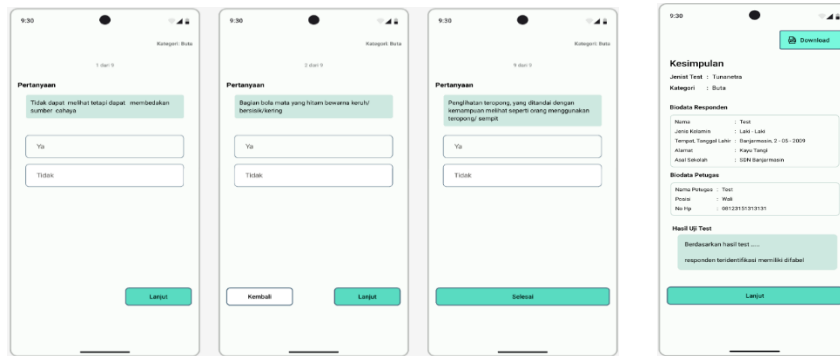


Figure 18. Test page display

Figure 19. Conclusion Page Display 1

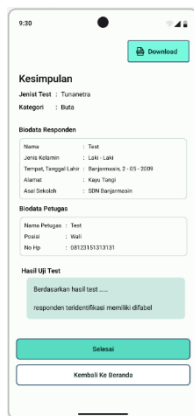


Figure 20. Conclusion Page Display 2

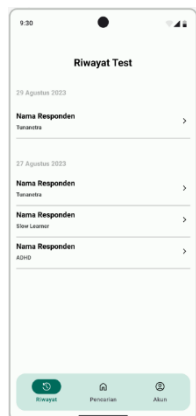


Figure 21. History Page View

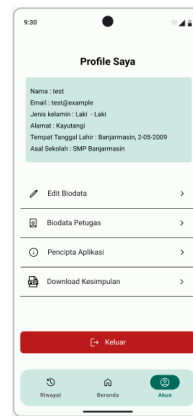


Figure 22. Profile Page View

After the SIDABEL application has been revised, the next step is to try out the SIDABEL application on Banua Anyar sub-district officers, Banjarmasin. The results of the Banua Anyar sub-district officer's assessment of the meaningfulness of the SIDABEL application received an average score of 4.54. Meanwhile, in the content presentation aspect, the average score was 4.56. The total average score for these two aspects was 4.55. It was in the very good category, used as an application for identification and data collection activities for people with disabilities. As a follow-up to the final trial results, this application has been uploaded to Playstore so that it can be downloaded and used by the wider community.

3.2 Discussion

Proper identification will really help teachers to provide appropriate treatment for people with disabilities. This matter will improve the quality of education in general (Satwika, Khoirunnisa, Laksmiwati, & Jannah, 2019). However, in reality, this has not worked as well as it should. One example occurred at Public Elementary School Tinggiran II.1. Teachers' knowledge about types of people with disabilities was still low. Teachers only knew people with disabilities who are physically disabled, such as the blind, deaf and quadriplegic. Beside that, there was still lack of understand and ability of teachers regarding the procedures for implementing the identification of people with disabilities, which includes

preparing instruments, collecting data and analyzing data. There were no documents in the form of instruments and data documents for disabled people identified at Public Elementary School Tinggiran II.1 (Amka & Mirnawati, 2022). That matter was in line with one of the problem findings in this research. Teachers without special education background have difficulty identifying people with disabilities correctly.

If the implementation of identification did not go according to procedures or there was an error in interpretation in determining the type of obstacles experienced by people with disabilities, it did not have an impact on the educational aspect. However, it also had an impact on other aspects of people with disabilities. This was because it was related to data collection on disabled people carried out by sub-districts. Data collection is the basis for empowering people with disabilities, both in terms of education, employment, entrepreneurship and others. If people with disabilities are not registered by name and by address completely and in detail, people with disabilities will not get their rights (Gandhawangi, 2023).

Geographical conditions are also one of the challenges in collecting data on people with disabilities. Some people with disabilities live in remote areas that are difficult to reach or require high costs for being visit. Apart from that, society's negative stigma towards people with disabilities also hinders data collection. This stigma makes some people hide their family members who have disabilities. They are not recorded either. It is feared that some people with disabilities may not even have population documents (Gandhawangi, 2023).

Currently, many systems applications of population data collection in sub-districts still use manual systems, namely Microsoft Excel, where many population data and files are still in the form of archives or documents. It creates several problems that are quite troublesome, especially in searching for data that takes a long time, and storing old data that is irregular, resulting in piles of files at the sub-district office (Rizal & Prasetya, 2021). Population data collection requires a system that is more accurate and easy to use (Astuti & Nasution, 2018). For example, the application for managing population data at the Sukamerindu sub-district office uses PHP programming and a MySQL database which has proven to make it easier for officers to manage population data in the Sukamerindu sub-district (Puspita, Muslim, & Aminah, 2019). Another example is the previous family population data collection in Gegerbitung village, which still used manual methods by recording data in books and processing the data using Microsoft Office. It has been proven to be less effective and efficient in reporting, and data is also easily lost or damaged. Then an Android-based family population data collection application was developed to make it easier for the Gegerbitung village government to input data. Android applications can be accessed directly anytime and anywhere, and make it easier to manage data, where data will be kept more secure because it has been stored in the database (Budinarsih et al., 2021). Therefore, this research develops the Disability Data Information System (SIDABEL) application by going through a series of stages starting from the analysis process to evaluation. The aim is to make it easier for teachers, sub-district officers, and the wider community to identify and collect data on people with disabilities.

The components contained in the SIDABEL application are: the initial display when opening the application is a splash screen, the splash screen will last for 5 seconds, **(2) Intro Screen**. After the splash screen you will enter the Intro page, this screen will appear every time the user opens this application again. On this screen, to continue to the next page, this is done by sliding the screen/display and when you reach the last slide there will be a "Start" button to continue to the next screen, the screen will shift automatically within 3 seconds, **(3) Login Screen**. On the Login page the user is asked to enter the previously registered account, on this screen the previously registered email and password will be asked. When the user input process has fulfilled the procedure, the screen will switch to the Home page. Apart from that, on the login screen there is a "Hint" button. When pressed, a pop up/capital will appear, **(4) Register Screen**. The Register page will only appear when the user presses "Register Now" on the Login screen page. On this page, the user will be directed to register an account that will be used in this application. Several inputs will be

requested on the Register screen page, namely: Name, Email, Password, Position, Mobile Number, **(5) Home Screen**. On the Home page the user will see several available test categories, each available category will have a card / container on each card which will contain the category name and description. If the user selects one of the categories available on the home screen, he will be directed to **the detail page for each category**. On the details page, there is a button to return to the Home page, the name of the selected category and description, and there is a "Start Now" button to start the test. When the user presses the "Start Now" button, the user will be asked to enter **the respondent's biodata** first before starting the test. The input required is as follows: Respondent's Name, Respondent's Date of Birth, Respondent's Place of Birth, Respondent's Gender, Respondent's Address, Respondent's School of Origin, Initial guess (Can be more than 1). After the user inputs the respondent's biodata, the user will be directed to the test page. On the **test page**, there will be one question, as well as the choices/options available. The user will be asked to select one of the available options. If the user does not select one of the available options, there will be a notification to "select the available option." When the user has finished carrying out the test, he/she will move to the conclusion page to see the test results/output. On the **conclusion page**, there is information from officers and respondents as well as conclusions from the test results that have been carried out. Users can download the conclusion in the form of a pdf file. If the test results are identified, the user will be asked to continue the test to the next category, **(6) History Screen**. On this page, the user will see a history of tests that the user has carried out. When one of the histories is clicked, it will go to the conclusion page that has been carried out, **(7) Profile Screen**. The profile page will contain user account information, and several buttons are available: (a) Edit Biodata. This button is used to change user information/biodata, (b) Application Creator. This button will direct users to the application creator page which contains the names of the application creators, (c) Exit. This button is used to log out/exit the application. When being pressed, there will be a pop-up to exit and cancel. When the user selects the exit option, the user will be directed to the Login page.

4. CONCLUSION

Our research results conclude that researchers develop the SIDABEL application with the ADDIE research development model with five stages that include needs analysis in carrying out identification and data collection activities for people with disabilities in riverbank areas (Analysis), designing the application content (Design), developing and validating the application (Development), implementing the application by conducting trials (Implementation), as well as evaluating the results of the responses given by teachers and sub-district officers as users (Evaluation), (b) based on the results of the SIDABEL application assessment by the Special School B/C Paramita Graha teachers, the average score was 3.81. On the other hand, the teachers at Public Speacial School Banjarmasin gave an feasibility of 3.94. Meanwhile, the Harapan Bunda Special School teachers gave an feasibility of 3.63. The feasibility results test was in the good category with several inputs obtained. The revised SIDABEL application was based on teacher input and assessments from the three SLBs. It was then tested on sub-district officers and got a final score of 4.55 in the very good category. In other words, the SIDABEL application can help teachers and sub-district officers for identifying and collecting data on people with disabilities in an area, including riverbank areas.

The limitations of the application developed in this research do not yet facilitate a special menu for identifying people with disabilities who have multiple barriers. Apart from that, the characteristics listed on the menu for disabled people with intellectual disabilities have not been grouped based on their classification. Therefore, further research can be done by developing applications to identify and record people with disabilities who experience multiple barriers.

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