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# Implementation of the "Bisheldig" Multimedia Educational Program to Enhance Health Standards within the Sakinah Household Group

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***Abstract*—** The Sakinah Household Group (Dasawisma Sakinah) faces challenges such as the digital divide and low health standards, with the frequent occurrence of flooding contributing to health issues. The Business, Healthy Living, and Digital (Bisheldig) program was created to address these concerns by offering education on digital technology usage and the promotion of clean and healthy living habits to vulnerable groups suffering from health-related problems. The objective of this study was to develop and assess the effectiveness of the Bisheldig program in enhancing digital literacy, focusing specifically on health behavior patterns, and improving the overall quality of life within the community. The Bisheldig program is designed using ADDIE model development, covering everything from analysis creation to evaluation. The program educates users on 10 essential health habits for households, such as childbirth assistance by healthcare professionals, exclusive breastfeeding, baby and toddler weighing, clean water usage, handwashing, sanitation practices, mosquito larvae control, daily physical activities, balanced nutrition, and maintaining a smoke-free indoor environment. Data was gathered through beta testing, revealing that the Bisheldig program significantly enhances digital literacy while promoting healthy living behaviors. This research offers insights for the development of multimedia-based health education initiatives and contributes to understanding the connection between digital literacy, public health, and information technology in improving household health outcomes.

***Keywords*—**Community Health, Dasawisma, Multimedia Application, Bisheldig, ADDIE Model

## I. INTRODUCTION

Samarinda City is the capital of East Kalimantan Province. Empirical evidence shows that the population and community activities in Samarinda continue to increase. This indirectly leads to increasingly significant problems. One persistent problem faced by Samarinda City is flooding. The topography, with many areas lying below the river's surface, is one of the causes of flooding in Samarinda City (Samarinda City Statistics Agency Team, 2024). In addition, the conversion of water catchment areas, drainage quality, and human behavior are other causes of flooding. As the city has grown substantially, one area with a high flood risk index is the North Samarinda District (Rachman et al, 2024; Agus et al, 2025). The development of digital technology has had a significant impact on the economy and public health in the current era. Educational programs focused on technology and health literacy can be key to improving the community's quality of life and economy.

Flooding has become almost a routine occurrence for the residents of RT 14 in South Sempaja Village, North Samarinda District. Residents have grown accustomed to this phenomenon, which in fact should be solvable. However, the impacts of flooding are generally accepted with resignation, including its health impacts. Floods can have serious effects on public health. The risk of waterborne disease transmission due to wastewater contamination increases, raising the likelihood of respiratory infections, diarrhea, and skin diseases (Bej et al, 2023). Contaminated floodwater may contain bacteria, viruses, and hazardous chemicals that endanger human health. In addition, flood conditions can create an environment that allows mosquitoes to breed, increasing the risk of communicable diseases such as dengue fever and malaria (Nwanaforo et al, 2024; Basaria et al, 2023).

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The stress and psychological impact of property loss and evacuation can affect the mental health of affected residents (Shiba et al, 2022).

this community service initiative aims to explore the empowerment potential of the Sakinah Household Group (Dasawisma Sakinah) in Samarinda City through the "The Business, Healthy Living, and Digital" program, or Bisheldig, which integrates digital and health aspects. Dasawisma Sakinah is a household group under the guidance of the PKK (Family Welfare Empowerment organization) of South Sempaja Village. This group is in RT 14, Gang Darmawan, South Sempaja.

Based on the data collected, the main problem faced by Dasawisma Sakinah is related to health. According to data on the 10 most common diseases from the Sempaja Public Health Center from 2021 to 2024, the top two diseases in RT 14, South Sempaja Village, are upper respiratory tract infection and diarrhea, followed by hypertension. The RT 14 South Sempaja area becomes a floodway when heavy rains occur. Usually, flooding lasts for several hours and then recedes gradually.

Given the rapid population growth and environmental challenges such as frequent floods, as well as the low digital literacy among members of Dasawisma Sakinah, there is an urgency to develop a program focused on these two important aspects. This study refers to empirical data showing that a strong understanding of digitalization and public health can have a significant impact on improving economic conditions and social welfare.

The Business, Healthy Living, and Digital (Bisheldig) digital education program will teach the 10 Clean and Healthy Living Behavior skills for households. This education will enable the community to empower household members so that they know about, are willing to, and are able to practice clean and healthy living behavior and take an active role in community health movements to achieve a healthy household (Dushkova & Ivlieva, 2024; Khatri et al., 2024; Anurogo et al., 2024). A healthy household is one that implements all 10 clean and healthy living behavior.

Through a comprehensive approach bridging two different fields, information technology and health, this study is expected to be a valuable contribution to the literature on community service. A careful analysis of the situation and problems, along with the solutions offered through the Bisheldig program, can serve as an important foundation for sustainable and positively impactful community empowerment efforts. It is hoped that the findings from this community service activity will provide insights and inspiration for similar programs in other communities and contribute to improving understanding of the interconnections between the digital economy, public health, and information technology in a relevant and inclusive local context.

This community service activity is also grounded in several research findings on the impact of training in improving family skills through technological use. Training in technology usage skills has a significant influence on productivity (Lee & Song, 2022). It was proven that after attending the training, participants became more creative in using their time and local resources to produce something marketable that provides economic value. The training and the ability to utilize technology had a positive and significant effect on productivity (Kabakus et al, 2025).

Research by Rosalianisa et al (2023), which involved developing a multimedia application, found that a play-while-learning application effectively improved children's understanding of educational material. Similar research by Sulistyanto et al (2023). showed that an educational game could be used by children to understand the archipelago's culture through a multimedia application.

The focus of this community service initiative also lies in health education using technology. The multimedia application developed will provide knowledge and skills about the 10 clean and healthy living behaviors by leveraging health technology. This educational approach can improve the quality of community health, as supported by several previous studies. Research by Buhake (2025) stated that an intervention or treatment applied to a certain group led to a significant reduction in anxiety levels. Comprehensive and structured outreach produces a positive impact and optimism for health improvements. The results of research by Gupta et al (2024) show that having a smoke-free home creates a healthy household. Research by Ismanudin & Nirwana (2024) demonstrates that fostering a healthy environment and clean and healthy living behavior practices in households can increase residents' awareness in implementing clean and healthy living behavior and achieving an optimally healthy environment. One of the factors that shaping intention is knowledge, and increasing knowledge will shape behavior. Research by Astutik et al. (2025) shows that counseling and training proved to be effective and significant in increasing knowledge about clean and healthy living behavior. Similarly, research by Hasyim et al (2021) indicates that clean and healthy living behavior counseling can improve the community's knowledge.

Through a measured approach, this community service activity is expected to contribute to understanding the role of digital technology and health education in empowering vulnerable communities and improving their quality of life. The findings from this community service can serve as a foundation for developing more effective health education programs.

## II. METHOD

The Bisheldig Health Education Program is a learning initiative focused on 10 healthy household lifestyle skills for families. It is carried out as a community service activity with the Sakinah Family Group (Dasawisma Sakinah) at RT 14, South Sempaja Village, Samarinda.

This educational program teaches community partners how to empower household members so that they know, want, and can implement healthy lifestyle practices at home. Participants are also encouraged to take an active role in community health movements to achieve the goal of having healthy households, 10 Clean and Healthy

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Living Practices for Households (Ismanudin & Nirwana, 2024; Samrah et al, 2021):

1. Childbirth assisted by health professionals.
2. Exclusive breastfeeding for infants
3. Weighing babies and toddlers regularly
4. Using clean water
5. Washing hands with clean water and soap
6. Using a sanitary latrine (toilet)
7. Eliminating mosquito larvae in the home
8. Eating fruits and vegetables every day
9. Engaging in physical activity every day
10. Not smoking inside the house

A household is considered *healthy* when it practices all the above habits. These 10 behaviors are critical skills that every family member should understand and perform to maintain a healthy living environment.

### *A. ADDIE Model Development*

The model used in developing this application is the ADDIE model. As shown in Figure 1, the ADDIE model is a generic process traditionally employed by instructional designers and training developers. It is dynamic, flexible, and useful in shaping effective training programs as well as serving as a practical tool for implementation. ADDIE is an acronym for Analyzing, Designing, Developing, Implementing, and Evaluating (Abuhassna et al, 2024; Mudjisusatyo et al, 2024; Gamal, 2023). This model can be applied to develop Android-based instructional media products. It was chosen because it is simple, procedural, and has a systematic structure. The explanation is as follows:

1. Analyzing the workflow of the application, using flowchart as a tool. At this stage, the educational health needs of the community are identified. Requirements are gathered from literature studies, the 10 healthy household habits material, interviews with the community health center and supporting materials from the internet such as images, audio, and music.
2. Designing the user interface of the application according to the initial concept, starting from the opening scene, main menu, and interactive media.
3. Developing the multimedia application based on the needs and design. The application is named *Bisheldig*.
4. The implementation stage is carried out through training with the community to determine its effect on improving public knowledge.
5. The final stage is evaluation, where the fully developed application is tested directly with the community. At this stage, N-Gain analysis is also conducted. N-Gain (Normalized Gain) is a method of analysis used to measure the effectiveness of learning or the improvement of participants' knowledge (Aziz et al, 2021)

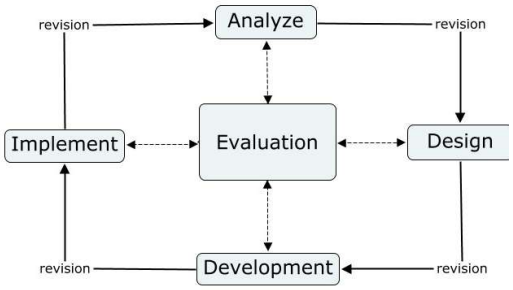


Figure 1. ADDIE Model

### *B. Analysis*

Figure 2 shows the flowchart diagram of the Bisheldig application. In this scenario, the user is the public, so the application is designed to be as easy as possible to use. The user can choose an education menu consisting of 10 options, containing materials on the 10 clean and healthy lifestyle practices for households. These materials range from content encouraging mothers to give their babies exclusive breastfeeding, content encouraging children to eat fruits and vegetables, to content urging fathers not to smoke inside the house.

The user can also toggle the background music on or off. The background music can be muted if the user feels disturbed or cannot focus on listening to the learning material due to the background music being too loud.

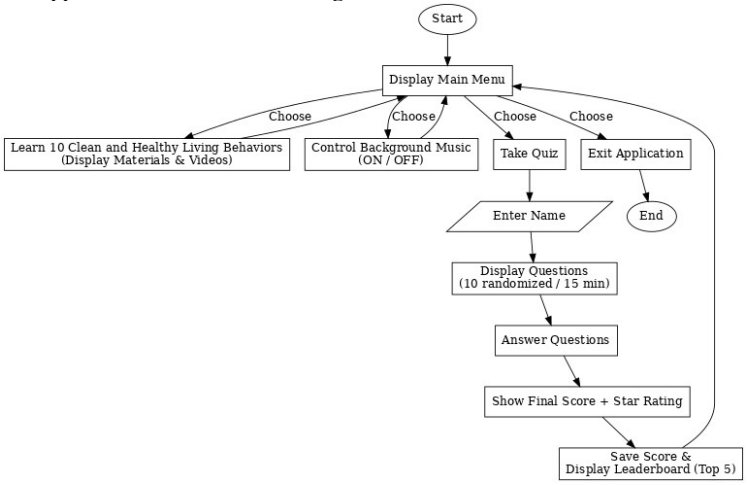


Figure 2. flowchart diagram of the Bisheldig Application

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Aside from containing material on the 10 clean and healthy lifestyle practices for households, this application is also designed to include a quiz to sharpen the user's understanding.

The materials collected for the Bisheldig multimedia application include educational content on the 10-household clean and healthy lifestyle practices obtained from the Sempaja community health center, as well as supporting media sourced from the internet. These supporting materials consist of background music for various scenes in MP3 format, sound effects such as button clicks and toggles in WAV format, graphical shapes for interface elements in PNG format, background images for menus and scenes in JPG format, and tutorial video recordings of the 10 healthy household habits practices in MP4 format.

Before starting the quiz, the user can enter their name, then proceed to answer the 10 multiple-choice questions provided. The quiz questions are based on the material of the 10 clean and healthy lifestyle practices for households. In this application, each question is worth 10 points, so if the user answers all questions correctly, they can achieve a score of 100 points. The time allotted to complete the 10 questions is 15 minutes, assuming 90 seconds are given for each question.

If time runs out, the application will display the final score and a star rating. After finishing the 10 quiz questions, the score is shown, and the user can see their proficiency in the knowledge of the 10 clean and healthy lifestyle practices.

The questions are displayed in random order by the application, so the user cannot simply memorize the answer keys. The user can also view their score history each time they complete all the questions, on a leaderboard. Users can compare their scores with other users on the same device (since the app is not connected to an online database). If the user's score is among the top 5, then that user's name and score will be saved and displayed on the leaderboard; but if the user's score is low and not in the top 5, it will be removed and not shown on the leaderboard.

### *C. Design*

After completing the entire concept of the application, the next stage is designing the application's Graphical User Interface (GUI). The GUI designed for the application includes the following scenes:

1. Opening Scene: The app's opening scene, which contains the title "BisHelDig" and information about the application's developer.
2. Main Menu Scene: Contains two buttons – a learning button and a quiz button.
3. Learning Menu Scene: Contains 10 selectable menu buttons corresponding to the 10 clean and healthy lifestyle practices for households.
4. Learning Video Scene (10 clean and healthy lifestyle practices): Contains the material and tutorial videos for the 10 clean and healthy lifestyle practices for households.
5. Registration Scene: This scene appears before the quiz begins; the user must enter their name before taking the quiz.
6. Quiz Scene: Contains the quiz questions on clean and healthy lifestyle practices for households. There are 10 question screens that the user must complete. The questions are in multiple-choice format with 4 answer options (A through E). The questions and answer options are displayed randomly, preventing the user from memorizing the answers. This scene also includes a countdown timer, giving the user 90 seconds to answer each question.
7. Final Score Scene: Displays the user's final score after completing the 10 quiz questions. The highest possible score is 100 points (if all answers are correct) and the lowest score is 0 points (if all answers are wrong or left blank). The Final Score scene also shows a star rating based on the user's score. If the score is low, the user receives a 1-star rating (or no star if the score is very low), and if the score is high, the user receives a 3-star rating — 3 stars being the highest.
8. Leaderboard Scene: Contains the history of user scores after taking the quiz on the 10 clean and healthy lifestyle practices. The score data is sorted from highest to lowest.

## III. Result and Discussion

The Bisheldig (Health Education) program was developed using a multimedia development approach. This application contains lessons on 10 clean and healthy lifestyle skills for households. The education provided is intended to empower household members so that they know, are willing, and are able to practice clean and healthy living behaviors and actively participate in community health movements to achieve a healthy household.

A comprehensive data analysis is presented to illustrate the effectiveness of the Bisheldig program in improving digital literacy and clean and healthy living skills. The Bisheldig application was developed to run on two platforms: Personal Computer (PC) and smartphone. This means the application can be used by community health centers when conducting seminars to promote healthy and clean-living habits to the public. Another advantage is that because the application is available on smartphones, Bisheldig can be used anywhere, given that nowadays almost everyone has a smartphone. This means mothers, fathers, and children can access this application anytime and anywhere using their own smartphones.

### *A. Development*

At this stage, the application was developed using the SwishMax 4 tool. There are 8 scenes implemented in the application, as described below:

1. Opening Scene – Figure 3 shows the opening scene that appears when the user opens the Bisheldig application. This scene contains developer information and if touched, it will proceed to the

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Menu scene. There are two display versions of this application: the portrait version shown in Figure 3, which fits a smartphone screen resolution, and a landscape version shown in Figure 4 that can fit a PC screen as well as a smartphone in landscape orientation. The screen orientation can automatically switch from landscape to portrait or vice versa when the user rotates their smartphone.


Figure 3. Opening scene of the Bisheldig application (portrait orientation)


Figure 4. Opening scene of the Bisheldig application in landscape mode

2. Main Menu Scene – Figure 5 shows the main menu scene of the Bisheldig application. In this scene, the user can choose the learning menu or take a quiz. If the Learn menu button is pressed, the user will be directed to the material covering the 10 clean and healthy lifestyle skills for households. If the Quiz button is pressed, the user will be directed to answer 10 practice questions about the 10 healthy lifestyle habits. In this scene, the user can also press the speaker icon button to toggle the background music on or off. The background music can be muted if the user feels disturbed or cannot focus on the learning material due to the music being too loud. The user can also press the X (exit) button if they want to exit the application.


Figure 5. Main Menu scene of the Bisheldig application.

3. Learning Menu Scene – The interface of the learning menu scene is shown in Figure 6. This scene contains 10 menu buttons, each of which, when pressed, will lead to one of the 10 educational topics on clean and healthy lifestyle skills for households. The user can also press the left-arrow button if they wish to go back to the main menu.

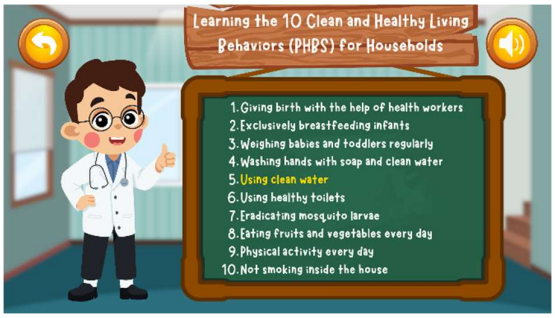


Figure 6. Learning Menu scene

4. Educational Video Scene for 10 Household Healthy Lifestyle Practices – In this scene, the user can view material about the 10 clean and healthy lifestyle practices for households. The material presented includes:
   1) Delivery assisted by healthcare personnel
   2) Providing exclusive breastfeeding to babies
   3) Weighing infants and toddlers
   4) Using clean water
   5) Washing hands with clean water and soap
   6) Using a sanitary latrine
   7) Eradicating mosquito larvae in the house
   8) Eating fruits and vegetables every day
   9) Engaging in physical activity every day
   10) Not smoking inside the house

   Figure 7 shows that the material is presented in the form of images and practice videos, making it easy for people using this application to understand and practice

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the behaviors in their own homes. In this scene, the user can control video playback with the YouTube video controls, including Play, Pause, Stop, Mute/Unmute, and others. The user can press the "→" (right arrow) button to view the next material and can press the "←" (left arrow) button to view the previous material.


Figure 7. Educational video scene for 10 Household Healthy Lifestyle Practices

It can be seen in Figure 7 that in this scene the user can also press the "home" icon button to return to the learning menu and choose other educational material.

5. Registration Scene – This scene appears initially after the user presses the quiz button. Figure 8 shows the registration scene, where the user must enter a name to proceed to the quiz questions. The username input can only accept a maximum of 6 alphabetic characters, so the user can only enter a short nickname. This is done to save the application's memory usage on the user's device. The user can only enter letters A to Z in this input; this filter is to prevent typing errors. If the user tries to enter a number or certain symbol, it will be rejected to avoid an invalid name. After entering a name, the user can press the "→" (right arrow) button to begin the quiz. The user can also press the "home" icon button if they want to cancel taking the quiz and return to the main menu.


Figure 8. Registration scene

6. Quiz Scene – Figure 9 shows the assembled interface of the quiz scene. This scene contains 10 questions about the 10 clean and healthy lifestyle skills for households. The questions are multiple-choice with 4 answer options from A to D (the text mentions A to E, but likely A–D since four options). The questions and answer choices are displayed in random order, so the user cannot memorize a fixed sequence. There is also a countdown timer running in this scene. The time given to answer all 10 questions is 15 minutes, which is an average of 90 seconds per question. If the user selects one of the answers, the text color of that chosen answer will turn yellow and then the next question will be displayed. If the user does not select an answer, the next question will not appear. This scene will not immediately indicate whether an answer is right or wrong, because the correctness of answers will only be calculated and shown in the Final Score scene. In addition, if the user has finished answering all the questions or the time runs out before they complete the quiz, the application will automatically proceed to the Final Score scene.

7.

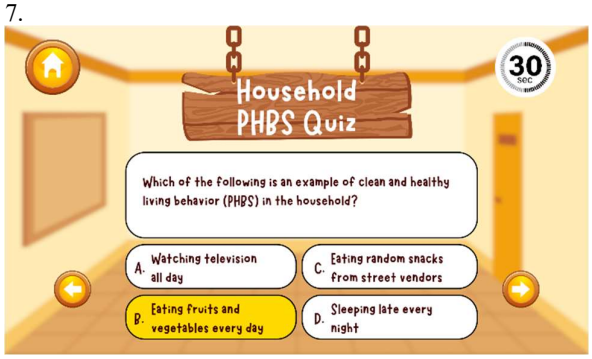


Figure 9. Quiz scene

8. Final Score Scene – This scene displays the user's score after completing the quiz. The score ranges from 0 to 100 points. Each correct quiz answer is worth 10 points. If all answers are correct, the user will get a score of 100. Conversely, if all answers are wrong or the user skips all questions, they will get a score of 0 and will not receive any star rating. There are 3 levels of star ratings in this quiz: if the user's score is above 30, they receive a 1-star rating; a score above 50 earns a 2-star rating; and a score above 70 earns a 3-star rating. A 3-star rating is the highest. For example, Figure 10 shows the interface displaying a score of 70, which means the user answered 7 questions correctly and thus obtained a 2-star rating.


Figure 10. Final Score scene

In this scene, the user can press the "reload" button to retry the quiz or press the "home" button to return to the main menu. If either of these two buttons is pressed, the score will not be saved. If the user presses the right arrow button, then the score will be

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saved and the user will be directed to the leaderboard scene.

9. Leaderboard Scene – Figure 11 shows the leaderboard scene, which contains the history of user scores on the quiz about the 10 healthy lifestyle practices. The score data is sorted from highest to lowest, with the name of the highest-scoring user at the top. This scene can display a maximum of 5 top usernames and their scores. Users can review their score history each time they finish the quiz, on this leaderboard. They can also compare their scores with other users who use the application on the same device (since it is not connected to an online database). If the user's score ranks in the top 5, then that name and score will be saved and displayed on the leaderboard. However, if the user's score is low and not in the top 5, it will not be kept and will not be displayed on the leaderboard.

Figure 11. Leaderboard scene

In this scene, once the user is done viewing the top scores, they can press the "home" icon button to return to the main menu.

*B. Implementation*

At the implementation stage of the ADDIE model, the Bisheldig application was deployed directly to the Sakinah Household Group (Dasawisma Sakinah) community. Figure 12 shows the installation process was carried out on the participants' smartphones to ensure accessibility and ease of use. Facilitators guided community members step by step in operating the application, beginning with the login and registration process, navigating the main menu, accessing learning modules, and completing quizzes. This stage also involved practical demonstrations and mentoring to guarantee that every household member could independently use the application in their daily lives. By applying the program within the actual community setting, the Bisheldig application was not only introduced but also integrated into the group's health education activities, ensuring that the learning objectives could be effectively achieved.


Figure 12. Implementation Bisheldig at Dasawisma Sakinah

*C. Evaluation*

The Gain test was conducted to examine the improvement in knowledge of the Dasawisma Sakinah group before and after using this multimedia learning media. The formula for normalized gain is presented in Equation (1):

$$G = \frac{(posttest\ score - pretest\ score)}{(maximum\ score - pretest\ score)} \times 100\% \quad (1)$$

The classification of Normalized Gain (N-gain) is divided into three categories (Samsudin et al, 2024; Aziz et al, 2021):

1. High Gain: G > 70%
2. Moderate Gain: 30% ≤ G ≤ 70%
3. Low Gain: G < 30%

Table 1 presents the results of the Normalized Gain (N-Gain) analysis for 20 respondents who participated in the Bisheldig program. The data includes pre-test scores, post-test scores, maximum scores, and the calculated N-Gain values. Prior to the intervention, participants' knowledge levels were relatively low, with pre-test scores ranging from 30 to 60 points. After using the Bisheldig application, there was a marked improvement, with most post-test scores reaching 80 to 100. The N-Gain values ranged from 0.50 to 1.00, with an average score of 0.73.

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Table 1. Results of the Normalized Gain Test Calculation

| Respondent | Pre-test | Post-test | Max Score | N-Gain |
|---|---|---|---|---|
| R1 | 50 | 90 | 90 | 0,80 |
| R2 | 40 | 80 | 80 | 0,67 |
| R3 | 50 | 80 | 80 | 0,60 |
| R4 | 50 | 80 | 80 | 0,60 |
| R5 | 50 | 90 | 90 | 0,80 |
| R6 | 60 | 90 | 90 | 0,75 |
| R7 | 50 | 80 | 80 | 0,60 |
| R8 | 60 | 90 | 90 | 0,75 |
| R9 | 60 | 90 | 90 | 0,75 |
| R10 | 50 | 90 | 90 | 0,80 |
| R11 | 50 | 100 | 100 | 1,00 |
| R12 | 60 | 80 | 80 | 0,50 |
| R13 | 60 | 80 | 80 | 0,50 |
| R14 | 40 | 90 | 90 | 0,83 |
| R15 | 30 | 90 | 90 | 0,86 |
| R16 | 40 | 100 | 100 | 1,00 |
| R17 | 40 | 80 | 80 | 0,67 |
| R18 | 60 | 80 | 80 | 0,50 |
| R19 | 50 | 90 | 90 | 0,80 |
| R20 | 50 | 90 | 90 | 0,80 |
| $\bar{X}$ | | | | 0,73 |

According to Table 1, the average N-Gain score was 0.73, or 73%, which falls within the high category (G > 0. 70%). This result indicates that the Bisheldig program was highly effective in improving participants' knowledge of the 10 Clean and Healthy Living Behaviors. These findings confirm that the multimedia-based health education approach successfully enhanced community understanding and demonstrated the potential of the Bisheldig application as an effective tool for empowering household groups in adopting healthier practices.

## IV. CONCLUSION

The Bisheldig program successfully increased digital literacy and awareness of clean and healthy living in the Sakinah household group (Dasawisma) in South Sempaja. This program was developed using the ADDIE model, which includes the stages of analysis, design, development, implementation, and evaluation. The resulting Bisheldig application presents 10 clean and healthy living skills in an accessible and interactive format, which is very important for the Dasawisma that often faces flooding, ensuring that health education continues uninterrupted by environmental conditions. An N-Gain test analysis by Dasawisma Sakinah indicates that this application successfully increased the community's knowledge about digital business and healthy household lifestyle patterns.

The success of Bisheldig in the Sakinah South Sempaja Dasawisma suggests that this educational model can be piloted and developed in other household groups in the future. The development of more varied content and interactive features, along with continuous evaluation, is recommended to improve the effectiveness of this program over time. The results of this community service activity demonstrate the success of digital literacy and health education in improving the quality of household health.

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