The Effectiveness Of Mobile Learning In Preventing Stunting In The Community

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Abstract

This research aims to develop mobile learning media for stunting prevention. The urgency of this research was the development of mobile learning on stunting prevention given to young women, pregnant women, and breastfeeding mothers. Indeed, the most asset was excellent human resources, one of which starts before the child is born. To realize healthy, intelligent, and productive children, optimal nutritional status was needed through continuous improvement of nutrition through various increasingly innovative approaches with information technology. Respondents in the study amounted to 36 people, namely teenage girls, pregnant women, and breastfeeding mothers from 17 years to 35 years—sampling technique with the purposive sampling method. The method used in this research was a mixed method. Based on the results of field tests obtained from testing respondents consisting of 36 respondents, namely 16 young women, eight pregnant women/pregnancy program, and 12 breastfeeding mothers, the percentage value of 86% could be obtained. Referring to the category scale, the percentages obtained by female respondents, pregnant women, and breastfeeding mothers are in the practical category. It could be concluded that the Ayo Prevent Stunting mobile learning was effectively used by

young women, pregnant women, and nursing mothers, and the product is ready to be distributed.

Keywords. Mobile learning, stunting, nutritional intake.

1.   INTRODUCTION

Information and Communication Technology has influenced and changed the activities of everyone in their daily lives[1]–[3]. Along with the development of information and communication technology, the media also develops. Media was a means to channel messages and information that provide a different and interesting experience[4], [5]. One of the technology-based media was mobile learning. Mobile learning was developing because of the rapid development of Information and communication technology today[6]–[12]. The use of mobile learning-based media was one of the 21st century information delivery[13]–[15]. The use of this type of media has the potential to help improve the performance of information that is up to date. The use of mobile learning-based media can facilitate stunting prevention information in the community quickly, easily, and can be accessed anywhere.

Stunting was a chronic nutritional problem caused by inadequate dietary intake for a long time. This could be due to food intake, not nutritional needs from the womb until toddlers. Stunting can occur from the womb and is only seen when the child was two years old. According to WHO, it was estimated that there are many cases around the world where children under the age of five have stunted growth due to stunting. The latest data in 2017 is around 22.2% or 150.8 million children under five are stunted[16].

Indonesia was a country that was included in the list of countries experiencing many stunting cases. The incidence of stunting or stunted growth of infants is one of the nutritional problems experienced by toddlers in Indonesia. The Basic Health Research results in 2007 showed the prevalence of

stunting in Indonesia was 36.8%. In 2010, there was a slight decrease to 35.6%. However, the most stunted toddlers increased in 2013 to 37.2% [17]. Based on these data, in Indonesia, stunting cases continue to occur with a percentage of above 35 per cent in the last two decades.

According to a report on research results in the According to a report on research results in the Mulyaharja sub-district, South Bogor sub-district, Bogor City, during 2019 there were many cases of growth faltering nutrition in toddlers whose effects at this time could cause brain development disorders[18]. Toddler was a period of golden development that will affect a person's quality of life in the future. Therefore, the handling of nutritional problems in toddlers was very important, even starting in the womb. The factor of lack of public knowledge about nutrition was also the cause of the many cases of stunting in Indonesia. The indicator of low community participation in the POSYANDU was measured by comparing the number of toddlers who come and are weighed at the POSYANDU (D) with the total number of toddlers targeted in the Integrated Service Post (POSYANDU) area (S)[19].

In a previous study, Oenema et al.[20] used interactive media to provide customized dietary and psychosocial feedback and reported promising results in increasing awareness and intention to change dietary behaviour. Their website, however, was evaluated under highly controlled conditions, with participants being asked to complete the entire web-based program on the spot and in a predetermined order[20]–[22]. The research was conducted by Gustafson, and Wyatt J [23] demonstrated that the Internet was a practical and acceptable approach to conveying health information and encouraging behavioural change and improvement of psychosocial determinants of dietary behaviour. It has been suggested that it was not sufficient to judge the quality of a web-based program solely by calculate website visits and that qualitative information should complement usage measures

quantitatively to examine user attitudes and the impact of these applications on users' lives and choices.

In a study conducted by Rusilanti et al [24] regarding applying a public education model on nutritional therapy for various diseases. Through mobile-based applications through articles and gifted programs. The community nutrition education model using the communitysehat.com web can increase public knowledge about nutritional therapy. The most significant barrier to using the website was lack of time, which agrees with findings from previous studies examining participants' perceptions of healthy eating promotion sites[25]–[29]. Several preliminary studies have been carried out on stunting discussed more prevention strategies and community behaviour related to nutrition and other determinants of stunting.

Some of the existing stunting prevention methods have not been implemented optimally. This can be seen from the low motivation and interest of the community in participating in counselling activities about stunting. Innovation and creativity are needed in learning that was applied in stunting prevention counselling activities[30]–[35]. Therefore, it was necessary to conduct a study to develop mobile learning-based stunting prevention learning media that can be applied in the community as a means of counselling. The development was expected to increase public knowledge about preventing stunting cases in Indonesia. This research focuses on developing digital-based educational activities to increase knowledge and awareness about nutrition to prevent stunting. This research was expected to grow mobile learning-based learning that can empower community elements such as POSYANDU cadres and other mobilizing groups in the community.

Based on the research background, the problem can be formulated, how was the development of effective mobile learning for preventing community stunting? This research

aims to develop mobile learning media for stunting prevention. The urgency of this research was the development of mobile learning on stunting prevention given to young women, pregnant women, and breastfeeding mothers. Indeed, the most asset of the Indonesian nation was its great human resources, one of which begins before the child was born. To realize healthy, intelligent, and productive children, optimal nutritional status is needed by continuously improving nutrition through various increasingly innovative approaches for young women, pregnant women, and breastfeeding mothers.

Stunting prevention activities can be carried out by making it easier for the public to access information about good nutrition during pregnancy, suitable diets for children under five, and healthy living behaviour. For this reason, learning that involves elements of the community at large was needed so that it can be accessed and beneficial for the development of learning models for these communities. One method of implementing activities to increase public knowledge through information technology regarding stunting and how to prevent it was carried out through several stages, namely, (1) developing materials on stunting prevention, 2) growing media, methods, and evaluations with the content of these materials, 3) validation of developed media, 4) socialization of advanced media, 5) evaluation of the implementation of the developed mobile learning-based learning. In terms of improving the stunting rate, it was hoped that every year it would decrease. The knowledge was given to young women, pregnant women, and breastfeeding mothers can prepare a healthy generation and take advantage of science and technology developments. Thus, it was hoped that this research could positively impact reducing stunting rates in Indonesia.

2.   RESEARCH METHODS

2.1.   Participants

Respondents in the study amounted to 36 people, namely teenage girls, pregnant women, and breastfeeding mothers aged 17 years to 35 years—sampling technique with the purposive sampling method[36]. The method of determining the sample was based on the consideration of the researcher or evaluator about which selection was the most useful and representative [37]. The model to be taken was determined based on knowledge about a population, its members, and the study's purpose. The sample was taken randomly. The details of the selection were as in table 2.1.

Table 2.1. Details of the number of samples

No	Age Range	Amount	Percentage (%)
1.	Teenage girl	16	44.44
2.	Pregnant mother	8	22.22
3.	Breastfeeding mothers	12	33.34
	Amount	36	100

2.2.   Data Collecting

This research data collection was carried out by searching for the necessary data on various forms and types of data in the field after carrying out data recording in the area. This study obtained data through:

* Observations and interviews with the community, extension workers and leadership apparatus in the Mulyaharja sub-district. As supporting data through documentation in documents or photos, or images. If face-to-face interviews cannot be conducted, they can be achieved via teleconference or interview using relevant technology applications.
* Data reduction was carried out since data collection begins by making summaries, coding, tracing themes, creating clusters, writing memos, and setting aside irrelevant data/information.

- Presenting or displaying data in qualitative research was carried out in brief descriptions, charts, relationships between categories, and the like. In addition, with the presentation of data, it would be easier to understand what happened, plan further work based on what has been understood. The data that has been selected, focused, and interconnected to clarify the research results are then described and systematically and can provide more explicit pictures of the effects of research in the field.
- Verification and confirmation of conclusions were done to look for patterns, themes, relationships, and similarities of things that happened. Conclusion drawing or verification can be carried out during the research and was a complete configuration activity to be said and guaranteed the credibility and objectivity of the research results.

The conclusion of this data was based on data reduction and data presentation, which was the answer to the problem raised in the study. The variables or objects used in this research were information systems and technology with mobile learning-based application development. To measure the effectiveness of information systems, using McCall's criteria[38] with indicators such as table 2.2.

Table 2.2. Criteria for the effectiveness of mobile learning

Criteria	Indicator	Form
Maintainability	Users and maintenance personnel can identify the damage software, fix crashes, and success in repair	can be analyzed, can be changed, stability, testable
Flexibility	Can be modified, styled rework, can be repaired accordingly user needs	Modification, reconfiguration
Testability	This IT-based learning system can be tested according to the program stunting prevention	Testable
Portability	The trend of this software can be used and adopted into various hardware devices and	Adaptability, can installed

	software.	
Reliability	The application system can provide service and overcoming failure	Maturity, fault tolerance
Correctness	How is this application system inline, with the stunting prevention program community-based	Fits with condition
Usability	It can be easy to use and applied in the program	understandable, can be learned, operable, attractive

2.3.   Data Analysis Techniques

Methods of data collection using interviews, observation, and documentation. The data analysis technique in this development research uses a qualitative approach. A qualitative approach was used because this study seeks to develop a learning model for stunting prevention. The instrument to test the feasibility of the developed product was validated by media experts and material experts using the Guttman scale[39], [40]. The score scale uses two answer choices, as shown in table 2.3.

Table 2.3. Guttman Scale[39], [40]

Score	Criteria
0	Disagree/No
1	Agree/Yes

The Guttman scale was chosen because the two available answers can provide a firmness of eligibility for each question item to be tested on young women, pregnant women, and breastfeeding mothers. If there are items that get a value 'No', they will correct according to the suggestions and inputs were given by media experts or material experts. Instrument analysis for media experts and content experts was calculated by the formula[41].

$$X = \text{total rating} \times 100\%$$
$$(2.1)$$

Note: X= Perfect rating

The results of the answers obtained by calculating the percentage score to develop conclusions can be explained in Table 2.4.

Table 2.4. Description of Analysis Results

No	Interval	Description
1.	0%-25%	There is no feasibility aspect
2.	25%-50%	It's low enough to have a feasibility aspect
3.	50%-75%	Has a feasibility aspect
4.	75%-100%	Height has a feasibility aspect

The instrument for the field test used a 5 Likers scale analysis technique with a detailed score of 5 = strongly agree, 4 = agree, 3=undecided, 2=disagree, and 1 = strongly disagree. The instrument lattice is shown in table 2.5.

Table 2.5. Grid of Respondents Instruments

No.	Indicator	No. Items	Number of items
1.	Use	1.	1
2.	Theory	2,3,4,5,6,7	6
3.	Design	8,9,10,11	4
4.	Voice	12.13	2
	Total		13

The answers were obtained by calculating the percentage score to develop conclusions as in Table 2.6.

Table 2.6. Description of Score Percentage

Score Presentation	description
X>75%	Ineffective

X≤ 75%	Effective

3.   RESEARCH RESULTS

The initial research was done by searching for secondary data on internet pages. The data results were used to explore information related to stunting. The announcement was a nutritious, healthy menu, child nutrition, nutrition for pregnant women, nutrition for adolescent girls, nutrition for breastfeeding mothers, development of learning media and factors that cause problems. The data was used to take steps to solve the problem. The material was delivered as needed to attract the interest of young women, pregnant women, and breastfeeding mothers in learning the importance of stunting prevention efforts. With the development of the Prevent Stunting mobile learning product, it was hoped to overcome the problem of stunting in early childhood. The result, research, and implementation of the Ayo Cegah mobile learning product has several contents and displays, including main menu content, information (news, categories), contacts, and videos. The results of the collection of mobile learning media were described as follows:

- Main Course

Mobile learning media displays an animated invitation to prevent stunting on the main menu page. Beside it, there was a cooking demo video, and at the top, there were home buttons, news, categories, and contacts. The main page view can be seen in Figure 3.1.

Figure 3.1. Main Display

- Related Information

Related information displays stunting prevention news for adolescents, pregnant women, and breastfeeding mothers. Related information can be seen in Figure 3.2.

Figure 3.2. Related Information

- Category

This page shows cooking demo videos by category for adolescents, pregnant women, and nursing mothers. Category display can be seen in Figure 3.3.

Figure 3.3. Category Display

- Contact

The contact page contains suggestions for mobile learning users who want to provide recommendations and input. Contact display can be seen in Figure 3.4.
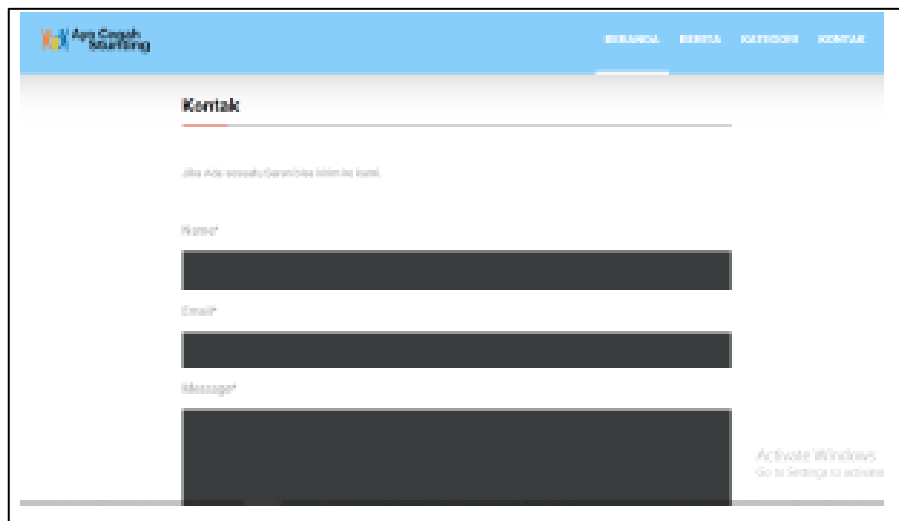

Figure 3.4. Suggestion Column

- Video

Some snippets from animated videos categories for teenagers, pregnant women, and breastfeeding mothers. Animated videos for teenagers, pregnant women and breastfeeding mothers can be seen in Figure 3.5.

Figure 3.5. Animation of Adolescents, pregnant women, and breastfeeding mothers

The results of the products that have been made are then tested by a team of experts/experts, namely testing by material experts and media experts. This test aims to determine whether the mobile learning media was already worth giving to the target or still needs to be improved. Before evaluating using a questionnaire, it is necessary to validate the questions asked by media experts and material experts so that the questions are valid or follow what was needed; two validators validated the media and material expert questionnaire. After validating the media expert and material expert questionnaire questions. A media expert and material expert questionnaire sheet were submitted to each of the two evaluators to obtain comparative data to improve stunting prevention through educational video products and making menus. Nutritious, healthy food for young women who are prospective mothers, menus for pregnant women, and menus for breastfeeding mothers.

The results of the media expert test can be seen in Figure 3.6.
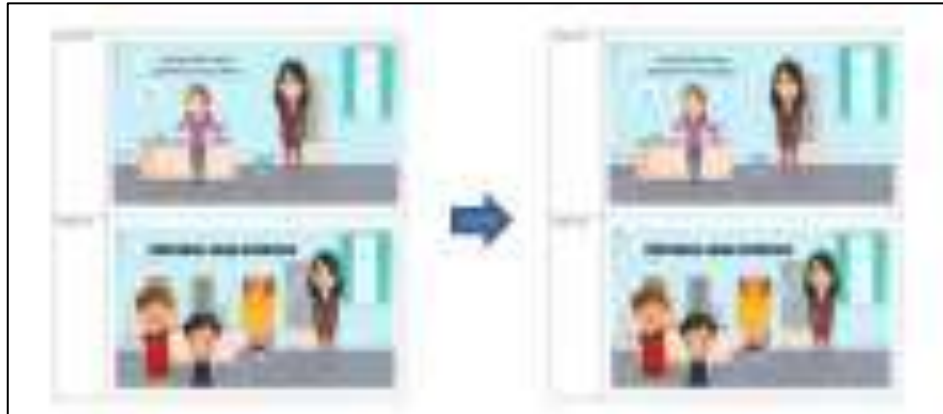

Figure 3.6. Revision Results of Media Experts

The results of media expert tests carried out on products developed based on research instruments can be seen in Table 3.1.

Table 3.1. Media Expert Validation Results

No.	Question Items	Score
1.	Correct colour choice	1
2.	Writing fonts can be read well and clearly	1
3.	Attractive appearance according to learning objectives	1
4.	The sound effects used are appropriate	1
5.	The sound used does not interfere with concentration	1
6.	The sound used was interesting	0
7.	The images displayed were clear and can provide information on learning media	1
8.	A balance between images and text	1
9.	Correct font size	1
10.	The typeface used can be read clearly	0
11.	Users can interact with the application	1

12.	The language used was appropriate and appropriate	1
13.	Website menu display can be clicked and can display material	1
14.	The material menu can be clicked and matches the material	1
15.	The instructions menu was clickable and displayed clear and easy-to-understand instructions	1
16.	The video menu can be clicked and can display videos learning	1
17.	Website buttons were clickable and work according to its use	1
	Total score	15
	Eligibility presentation	88.2%

Media expert validation results were carried out, suggestions for improvement were obtained with a high percentage of 88.2% and fit into the criteria "Meet the eligibility aspects". Media can be a field test.

The results of the material expert test were in the form of adding an explanation of the benefits and helpful video material slowed down for the stunting prevention program menu. Based on the material results, expert tests carried out can be seen in Table 3.2.

Table 3.2. Material Expert Validation Results

No.	Question Items	Score
1.	The suitability of the material in achieving the goal learning	1
2.	Ease of understanding	1
3.	The accuracy of the content of the material about stunting	1
4.	The suitability of the content of the material with the target audience	1

5.	The suitability of the illustration with the material being taught	1
6.	Conformity with the evaluation carried out	1
7.	The language used was following the rules	1
8.	Provide learning assistance to users	1
9.	The material presented in the media can have a positive impact on users	1
10.	The material presented in the media can produce good interactions	1
11.	The material presented in the learning media was accurate	1
12.	Every sentence in the video has a precise meaning	0
	Total score	11
	Eligibility presentation	91.7%

Based on the validation results of the material experts, the learning media obtained suggestions for improvement with a high percentage result with the percentage obtained was 91.7%, and it into the criteria "Fulfil feasibility aspect". The media can conduct field trials. So, it can be concluded that the mobile learning Prevent Stunting was feasible to test on young women, pregnant women, and breastfeeding mothers.

Based on the results of field tests obtained from testing respondents consisting of 36 respondents, namely 16 young women, eight pregnant women/pregnant programs, and 12 breastfeeding mothers, the percentage value of 86% can be obtained. Referring to the category scale, the percentages obtained by female respondents, pregnant women, and breastfeeding mothers are in the practical category. It can be concluded that the Ayo Prevent Stunting mobile learning is effectively used by young women, pregnant women, and nursing mothers, and the product was ready to be distributed. The results of the researchers' observations through the google

form after using the product that has been developed. This shows that the Prevent Stunting mobile learning product for young women, pregnant women and breastfeeding mothers can add new insights related to stunting prevention materials in children.

This research and development result was mobile learning as a learning media to provide the information needed for young women, pregnant women, and breastfeeding mothers about stunting prevention efforts. Mobile learning can be utilized through various devices or devices with an internet network. The use of Prevent Stunting mobile learning consists of several categories. If you have entered the mobile learning application, young women, pregnant women, and breastfeeding mothers will be on the initial screen. After that, there are three video options about the process of making healthy and nutritious menus for young women, pregnant women, and breastfeeding mothers, which are expected to help meet nutritional needs in efforts to prevent stunting. Then there are also some news or other articles related to the Nutritional Adequacy Number. Mobile learning Prevent Stunting was a media developed to increase knowledge with nutrition education and additional information about stunting prevention for young women, pregnant women, and breastfeeding mothers. The introduction of material related to stunting is based on the opinion of WHO that stunting was a child's growth and development disorder caused by lack of nutritional intake, infection, or inadequate stimulation. Therefore, Prevent Stunting mobile learning was developed as attractive and efficient as possible to be readily accepted by young women, pregnant women, and breastfeeding mothers to prevent stunting in the community.

Instructional as a structured combination includes human elements, materials, facilities, equipment, and procedures that influence each other to achieve learning objectives[42]–[45]. Furthermore, it was stated that the humans involved in the

instructional system consisted of students, teachers, and other personnel, such as laboratory personnel. Materials, including books, blackboards and chalk, photography, slides and films, audio, and videotapes. Facilities and equipment consist of classrooms, audio-visual equipment, and computers. Procedures include schedules and methods of delivering information, study practices, exams, etc.

The instructional process requires the management of instructional components and strategies, including technology and media that can be used as tools in implementing instruction. Instructional methods include presentations, demonstrations, exercises and drills, tutorials, discussions, group learning, games, simulations, discovery, and problem-solving. Instructional strategies need to be well designed by considering the use of appropriate technology and media according to the material characteristics, the characteristics of the learners, or the types of learning environments[46]–[51].

Instructional strategies were divided into two categories: teacher centred and student-centred systems. The teacher is the key to determining what instructional strategy will be designed for the two categories of methods. What differs between the two was the focus or purpose of the process? In general, what the teacher has created determines instructional success. In designing instruction, we can decide how well students followed the instruction and how effective the instruction was depending on the right strategy. The following are some learning conditions that require the right design and media for effective learning.

Student-centred strategies focus on guiding and directing students. Teachers still have the responsibility to plan and develop student-centred learning and learning. The teacher's role was to facilitate learning, individually or in small groups, and help students stay focused on achieving learning outcomes.

4. CONCLUSION

The result of this research was a mobile learning-based learning media that was effectively used as a medium for stunting prevention programs in the community. The implications of the research results for the community, especially stunting program cadres, are to utilize learning media in stunting prevention programs. Stunting can occur before birth due to insufficient nutritional intake during pregnancy, poor food parenting, low food quality in line with the frequency of infection so that it can inhibit growth. Mobile learning let's prevent stunting is a shared learning media about health for young women, pregnant women, and breastfeeding mothers in digital instruction, which aims to increase knowledge in preventing stunting. The results of this study emphasize that there is a need for similar activities to continue to share information on stunting prevention for young women, pregnant women, and breastfeeding mothers so that they can give birth to a healthy and intelligent generation.

The advantages of the Prevent Stunting mobile learning include a) It was suitable for the categories of teenagers, women, pregnant women, and breastfeeding mothers regarding stunting information; b) Easily accessible via various hardware devices; c) it could be used anytime and anywhere; d) Can be a reference for prospective mothers or mothers in monitoring the growth and development of children. Meanwhile, the shortcomings of Prevent Stunting mobile learning are that there is not much information about further stunting, which causes the acceptance of this media to lack reader interest. There were still very few efforts to develop the contents in it. Weaknesses of mobile learning Let's Prevent stunting on the Internet and more exciting content and better information.

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Biographies

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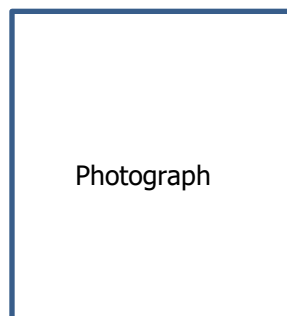
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