



DEVELOPMENT OF INTERACTIVE EDUCATIONAL MEDIA FOR PREVENTING ANEMIA IN TEENAGE GIRL BASED ON E-FLIPBOOKS AS AN EFFORT TO ACCELERATE STUNTING REDUCTION

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ABSTRACT	Keywords
Stunting or short toddlers is currently one of the toddlers problems toddlers in the world. Stunting is important because it concerns about the quality of Indonesia's human resources in the future. The incidence of stunting is a cycle. Children born to mothers who are anemic will suffer stunting in the future and continue without stopping, which is called the intergenerational stunting cycle. Improving adolescent nutrition before conception is one way to break the intergenerational cycle of stunting. This research aims to develop interactive educational media for preventing anemia in adolescents based on e-flipbooks as an effort to accelerate stunting reduction. The research method used is Research and Development (R&D), with the final results of this research is producing an e-flipbook for preventing anemia in adolescents. The research instrument used a questionnaire. There are 2 data analyzes used, qualitative and quantitative analysis. The validation test results from material experts and media experts stated that this educational media for preventing anemia in adolescents is very suitable for use with a percentage of 90%. And the results of field trials on anemia prevention educational media are mostly in the very feasible category with a percentage of 87.03%.	Educational Media, Anemia, Teenage Girl, E-Flipbook, Stunting

INTRODUCTION

Stunting is a condition where a toddler has less length or height compared to age. This condition is measured by body length or height that is more than minus two standard deviations from the median of WHO child growth standards (Kemenkes RI, 2018). Stunting or short toddlers is currently one of the toddlers problems toddlers in the world. Stunting is important because it concerns about the quality of Indonesia's human resources in the future (Kemenkes RI, 2022). Stunting will also

cause children to be more susceptible to disease in the future. In the end, stunting will generally hamper economic growth, increase poverty and widen inequality (Arsyati, 2019).

The World Health Assembly (WHA) target is to reduce the prevalence of stunting by 40% by 2025 from 2013 (WHO, 2014) which is reinforced by the "zero hunger" target of the Sustainability Development Goals (SDGs) to eliminate all forms of malnutrition by 2030 and reduce the prevalence of stunting in children will be 50% in 2030 (United Nations, 2015). The

prevalence of stunting under five is expected to decrease to 19.4% in 2024 (TNP2K, 2018). Based on the results of the 2021 Indonesian Toddler Nutrition Status Survey (SSGBI), it shows that the prevalence of stunted (very short and short) is still at 24.4% with a reduction rate of stunting of 2.4%. Since 2018, East Java itself has had 18 districts/cities with a stunting prevalence of more than 20% (Kemenkes RI, 2021). Data from the Sampang Health Service shows that the prevalence of stunting in Sampang Regency in 2021 is 17.2%. This figure is still below the national target of 14% in 2024 (TNP2K, 2018).

Children born to mothers who are anemic will suffer stunting in the future and continue without stopping, which is called the intergenerational stunting cycle. Improving adolescent nutrition before conception is one way to break the intergenerational cycle of stunting between generations (Resmiati, 2021). The existence of teenagers is currently one of the focuses of global policy to achieve development goals in 2030. The population of teenagers in the world reaches 1.2 billion people out of a total population of 7.6 billion people. In Indonesia, the population of teenagers (10-19 years) is 46 million (UNICEF, 2021). So efforts are needed to strengthen adolescent health services in accordance with the national stunting prevention program.

This research aims to develop educational media to prevent anemia in adolescents based on e-flipbooks as an effort to accelerate stunting reduction. Digital flipbooks (e-books) have animation, music and video features so they are more interesting than printed books. Digital flipbooks can be accessed anytime and anywhere. So it is hoped that the results of this research can later be used as an educational medium that can be used to prevent anemia in adolescent girls so that it

can reduce the incidence of stunting in the future.

METHOD

The research method used is Research and Development (R&D), this research method is used to produce certain products and test the effectiveness of these products. This development research uses the ADDIE model. The ADDIE model consists of five stages, namely Analysis, Design, Development, Implementation and Evaluation. The research flow diagram used is as follows :

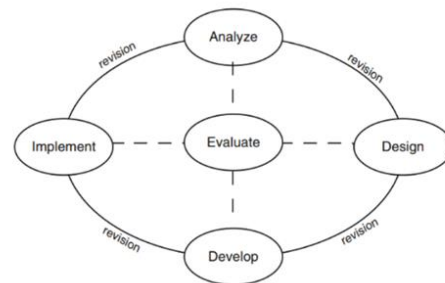


Figure 1. The ADDIE concept (Branch, 2009).

The ADDIE model can be used for various forms of product development in learning activities such as models, media and teaching materials. The research steps carried out are :

1. Analysis, at this stage an analysis of the needs or problems that exist in the field is carried out. Then, initial data was collected through interviews with 10 teenage girl from the first semester of the Nursing Study Program of Poltera to find out what educational media are needed by teenage girlto make it easier to understand the material on preventing anemia in teenagers.
2. Design, design activities start from designing the concept and content in the product. At this stage the product design is still conceptual and will underlie the development process at the next stage. Apart from that, we also create

- instruments to measure product performance.
3. Development, contains activities to realize product designs that have previously been created. After the educational media is completed in finished product form, validation is carried out by material experts and media experts.
 4. Implementation, at this stage a trial of the product that has been developed is carried out by distributing response questionnaires to 30 female students in the first semester of the Nursing Study Program of Poltera. The data obtained is used to carry out further improvement processes.
 5. Evaluation, the media assessment stage is carried out by users. Questionnaires were distributed to 54 teenage girl at the youth posyandu activities in Palenggiyan Village and Bajrasokah Village, Kedundung subdistrict, Sampang regency.

This research was carried out in September – November 2023 in Sampang, East Java. The research instrument used was a questionnaire. There are 2 data analyzes used, namely qualitative and quantitative analysis.

RESULTS

Product development starts from the analysis stage, by collecting initial data through interviews with 10 teenage girl to find out what educational media are needed by teenage girl to make it easier to understand the material on preventing anemia in teenagers. The results of the analysis obtained are :

1. All teenage girl who took part in the interview said they had attended counseling about anemia but did not understand the information provided.

2. Extension activities use leaflets as a medium for conveying information and sometimes videos are also shown.
3. Eight out of ten participants stated that it would be more interesting and easier to understand if the outreach material was packaged in digital form which could be accessed anytime and anywhere with an attractive appearance, containing not only text and images but also videos or even music.

The second stage is product design, at this stage the material design and flipbook design are carried out. At this stage the product design is still conceptual and will underlie the development process at the next stage. Apart from that, at this stage an instrument is also created to measure product performance. The third stage, namely development, contains activities to realize the product design that has previously been created. After the educational media is completed in finished product form, an assessment is carried out by material experts and media experts. The expert team provides an assessment which is used as a reference for revising educational media to improve it, so that the learning media developed is suitable for use, the results are :

1. Material expert assessment

The results of the assessment from material experts on the e-flipbook-based educational media for preventing anemia in teenage girl can be seen in the following table :

Table 1. Results of E-Flipbook Based Educational Media for Prevention of Anemia in Teenage Girl by Material Experts.

No.	Validator	Value (%)	Criteria
1.	Material Experts	92	Very worthy

Based on the assessment of material experts, the percentage obtained was

92%, which means that this media is very worthy for use as an educational medium for preventing anemia in teenage girl.

2. Media expert validation

The results of the media expert's assessment of e-flipbook-based educational media for anemia prevention in teenage girl can be seen in the following table :

Table 2. Results of E-Flipbook Based Educational Media for Prevention of Anemia in Teenage Girl by Media Experts.

No.	Validator	Value (%)	Criteria
1.	Media expert	88	Very worthy

Based on the assessment of media experts, the percentage obtained was 88%, which means that this media is very worthy for use as an educational medium for preventing anemia in teenage girl.

3. Recapitulation of Assessment by Experts

Table 3. Recapitulation of E-Flipbook Based Educational Media Assessment for Prevention of Anemia in Teenage Girl.

No.	Validator	Value (%)	Criteria
1.	Material Experts	92	Very worthy
2.	Media expert	88	Very worthy
	Average	90	Very worthy

It can be concluded that from the assessment of material experts and media experts, this e-flipbook-based educational media for anemia prevention in teenage girl is included in the very worthy category with a percentage of 90%.

After the product design is assessed by experts, improvements are then made. Then continued with the fourth stage of implementation, at this stage a limited trial of the product that had been developed was

carried out by distributing response questionnaires to small groups of 30 teenage girl, the results were :

Table 4. Results of E-Flipbook Based Anemia Prevention Educational Media Trial in Teenage Girl.

No.	Criteria	n	%
1.	Very worthy	22	73,33
2.	Worthy	8	26,67
	Total	30	100

Table 4 shows that the results of the anemia prevention educational media trial were mostly in the very worthy category, namely 22 respondents (73.33%), and within the worthy criteria with 8 respondents (26.67%).

The final stage is evaluation, the media assessment stage is carried out by users using field tests, by asking users to use the resulting e-flipbook interactive educational media. Questionnaires were distributed to 54 teenage girl at the youth posyandu activities in Palenggiyan Village and Bajrasokah Village, Kedundung subdistrict, Sampang regency, results :

Table 5. Field Test Results of Educational Media for Preventing Anemia in Teenage Girl Based on E-Flipbooks.

No.	Criteria	n	%
1.	Very worthy	47	87,04
2.	Worthy	7	12,96
	Total	54	100

Table 5 shows that the results of the field trial of this anemia prevention educational media were mostly in the very worthy category, namely 47 respondents (87.03%), and within the worthy criteria with 7 respondents (12.96%).

DISCUSSION

The results of research on field trials of anemia prevention educational media stated that the flipbook-based anemia prevention educational media for teenagers was in the very feasible category as assessed by the majority of respondents, 47 teenage girls (87.03%), and within the appropriate criteria by 7 rating respondents (12.96%).

According to Yulius (2016), the determinant of the success of a health promotion media can be seen from the feedback received by the community regarding how to respond to health aspects in people's lives (Yulius, 2016). Health promotion media are all means or efforts to display messages or information that the communicator wants to convey, both through print and electronic media, so that targets can increase their knowledge which is then expected to result in changes in behavior in a positive direction in the health sector. In practice, health promotion cannot be separated from the media. Because through this media the health messages conveyed become clear and easy to understand, so that the target can easily receive the messages conveyed (Jatmika, 2019).

The combined use of various health promotion media models can increase information absorption. If possible, a combination of several health promotion media can be used to increase message acceptance. The more senses are used to receive messages, the more information messages are absorbed (Ernawati, 2022). The educational target is to absorb more information by using good and interesting media, especially combining visual and auditory aspects (Muwakhidah, 2021). Several conditions that must be met in using media so that the delivery of information can be more effective include, among others, it must be interesting, appropriate to the target, easy to understand, short and clear and in accordance with the message to be conveyed (Az-zahra, 2022).

This research develops educational media to prevent anemia in teenagers based on e-flipbooks. Digital flipbooks (e-books) have animation, music and video features so they are more interesting than printed books. Digital flipbooks can be accessed anytime and anywhere. Flipbook is an application

known as professional software that turns a PDF into a whole flash book (Afandi, 2023).

The results of this research can be used as educational media that can be used to increase teenage girls' knowledge about preventing anemia in teenage girls. Nutrition education as a strategy to prevent anemia in teenagers aims to inform teenagers about their specific energy and nutritional needs, including iron, as well as the benefits of adopting a healthier lifestyle and diet (Roche, 2018). By increasing knowledge about anemia prevention, it is hoped that teenage girls will be able to implement anemia prevention behavior in their daily lives, such as taking one blood supplement tablet per week and one tablet every day during menstruation, so that they can reduce the incidence of stunting in the future.

CONCLUSIONS

Based on the results and discussion in this research, it can be concluded that e-flipbook-based educational media for anemia prevention in teenage girl is included in the very worthy category. So it can be used as an educational medium that can be used to increase knowledge about preventing anemia.

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