

Development of Digital Module on Early Childhood Health and Nutrition

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Abstract. The purpose of this study was to develop a digital module on early childhood health and nutrition. The development was carried out using the research and development research method by borg & gall, the test results from the small group showed an average score of 3.67 (good category), and the average score in the large group was 3.76 (good category). the final product is a module that can be accessed via smartphones, tablets, laptops, etc. via download from the playstore. The advantages of the digital module on early childhood health and nutrition are the many references used from the latest books and, this book is also designed with attractive illustrations and colors to increase reader motivation and increase the brain's ability to store information in the form of words, color and pictures, this book also arouses the reader's desire to think critically and conduct further analysis.

Keywords: Digital module, system, early childhood health, nutrition.

1 Introduction

The education system certainly has a basic goal that is used as a reference for the implementation of education. At this time education is an important basic need and must be owned by every individual. at the university level Early childhood health and nutrition is one of the compulsory subjects that must be taken and studied in lectures at the Medan State University in Early Childhood Bachelor Program. Every colleger will become prospective early childhood education teachers, teachers should have a good understanding of nutrition or early childhood nutrition[1]. Collegers need this knowledge to help their educational interests and future performance. There are the limitations in the COVID-19 pandemic situation, the world of education as a subsystem of community life needs to respond openly to various innovations in the world of education by improving learning experiences, meaningful experiences during the learning process will make it easier for colleger to achieve learning outcomes [2]. By utilizing the technology that is currently developing, the delivery of learning can be easily used various interactive modules. Modules that stimulate students to think critically and encourage them to explore information will create an environment that supports learning activities [3]. The use of technology, the role of the lecturer in choosing the right method will be affect to colleger learning outcomes [4], but in the application of learning during a pandemic the obstacles that are often faced are the quality and quantity of learning resources that are not good, collegers are often given a source of teaching materials, but not in

accordance with the lecture material and has not been able to increase the desire of students to read additional literature, so that during the current pandemic the improvement of learning is needed, and the digitization of learning devices has become a must in the current digital era, digital learning modules can make college students' reading interest higher because of the interactive, practical and efficient nature of digital modules. Development of digital modules for early childhood health and nutrition needs to be done to answer the challenges of the current pandemic situation and help achieve the planned competencies.

2 Method

The stages of implementing the development research used in this study using the development stages proposed by Borg and Gall [5] can be grouped into three stages, namely Stage 1: preliminary research and information collecting studies. Stage 2: product development, includes two activities: (a) planning and (b) developing a preliminary form of product. Stage 3: product validation includes seven activities: (a) preliminary field testing, (b) main product revision, (c) main field testing, (d) operational product revision, (e) operational field testing, (f) final product revision, (g) dissemination and implementation.

The research was conducted in Early Childhood Bachelor Program at Medan State University. The population in this study used the fifth semester they are. The sampling technique was done by random sampling, in this study, the data collection techniques used were questionnaires and interviews. Data analysis is done by calculating the total score and its average then interpreting it on a Likert scale.

3 Result and Discussion

The study was conducted by analyzing the potential that can support research as well as the problems faced by researchers, internally this research was supported by experienced human resources, the development of early childhood health and nutrition modules was carried out by researchers who are also lecturers in the subject who have taught the subject. For at least 3 consecutive years, researchers and lecturers are a combination of senior lecturers who are very experienced in health and nutrition courses and combined with young lecturers who have high work ethic and the latest ideas so that they become the strength that supports this research. This potential is of course accompanied by inhibiting factors in research, such as currently being "work from home" due to the unfavorable global situation, through forum group discussion with lecturers who are in charge of courses and then by interviewing college students, information on course materials is obtained. The researcher then compiled the material contained in the module, namely: (1) Basic Concepts of Health and Nutrition, (2) nutritional adequacy in children, pregnant and lactating mothers, (3) Relationship of Health and Nutrition with Developmental, (4) Relationship between Nutrition and Brain Developmentally Appropriate Practice, (5) Human Digestive System, (6) Development of Balanced Food for Children, Pregnant and Breastfeeding Mothers, (7) Nutritional Adequacy Rate, (8) Nutrition

for Children with Special Needs, (9) Principles and Ways of Caring for and Maintaining Health in Infants and Children, (10) Immunization, (11) Early Childhood Health Disorders, (12) First Aid In Accidents, (13) Terms in Health and Nutrition. This initial product, of course, went through validation from experts first and revised it so that the initial product was created. The initial product test involved two experts, the following is an assessment of the initial product test.

Table 1. Initial product test results.

Assessment Aspect	Score		Average Score	Description
	Expert 1	Expert 2		
Content Eligibility	2,95	2,81	2,88	Enough
Presentation Eligibility	2,69	2,77	2,73	Enough
Linguistic Aspect	3,00	2,92	2,96	Enough
Total	8,64	8,50	8,57	
Average	2,88	2,83	2,85	Enough

Based on the questionnaire filled in by the expert, suggestions were obtained to add questions at the end of each module. revisions are made by adding theoretical sources that refer to concepts and definitions, adjusting images to make them more accurate, adding questions at the end of the module, and using terms consistently, then tested the limited test to 6 students with the following results.

Table 2. Limited test results.

Assessment Aspect	Score						Average Score	Description
	1	2	3	4	5	6		
Content Eligibility	3,71	3,76	3,71	3,67	3,62	3,62	3,68	Good
Presentation Eligibility	3,61	3,69	3,54	3,54	3,54	3,61	3,59	Good
Linguistic Aspect	3,69	3,69	3,77	3,69	3,69	3,85	3,73	Good
Total	11,02	11,15	11,02	11,89	11,84	11,08	11,00	
Average	3,67	3,71	3,67	3,63	3,61	3,69	3,67	Good

The results of the limited trial were in good category but to improve the quality of the early childhood health and nutrition module the research team looked again to minimize errors in writing and errors in image design, after that the research continued with the main product test on 25 students with the following results.

Table 3. Main product test results.

Assessment Aspect	Assessment Aspect Description	Score	Average
Content Eligibility	• The suitability of the material with learning outcomes	88,3	3,53
	• Material accuracy	90,0	3,60
	• Supporting learning materials	89,7	3,59
	• Material updates	88,3	3,53
Presentation Eligibility	• Presentation technique	92,0	3,68
	• Serving support	92,0	3,68
	• Presentation of learning	94,0	3,76
	• Presentation equipment	94,3	3,77
Linguistic Aspect	• Straightforward	95,3	3,81
	• Communicative	95,5	3,82
	• Dialogic and interactive	92,5	3,70
	• Conformity to the level of development of students	92,0	3,68
	• Coherence and coherence of the flow of thought	96,5	3,86
	• Use of terms, symbols or icons	91,0	3,64
Total			3,69
Average			Good

The results of product trials in the large group have shown a score of 3.69 with a good category, so no revisions are made and then the digital module will be processed for copyright and uploaded to the network so that it can be used by students.

4 Conclusion

The conclusion of the study is that the study was conducted to develop a digital module on early childhood health and nutrition with the materials (1) Basic Concepts of Health and Nutrition, (2) nutritional adequacy for children, pregnant and breastfeeding mothers, (3) Relationship of Health and Nutrition with developmentally appropriate practice, (4) Relationship between Nutrition and Brain Development, (5) Human Digestive System, (6) Development of Balanced Food for Children, Pregnant and Breastfeeding Mothers, (7) Nutritional Adequacy Rate, (8) Nutrition for Children with Special Needs, (9) Principles and How to treat and maintain health in infants and children, (10) Immunization, (11) Early Childhood Health Disorders, (12) First Aid in Accidents, (13) Terms in Health and Nutrition, which are designed with text, images and colors attractive in digital form. The effectiveness of using this development helps students to achieve better learning achievements. The images and colors used increase their motivation to read [6][7]. It also represents some of the participants who have a visual learning style [8]. The description is not too long and the presence of empirical images that become examples of everything conveyed in the book. This module was

developed using the development method by Borg & Gall with the product test results in a good category and suitable for use in lectures

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References

- [1] Vlieger ND, Rossum VJ, Riley, Miller A, Collins C, Bucher T. Nutrition Education in the Australian New South Wales primary school curriculum: knowledge and attitudes of students and parents. *Children*. 2020; 7 (4).
- [2] Meyer M et al. How educational are ‘educational’ apps for young children? App store content analysis using the Four Pillars of Learning framework. *J. Child. Media*. 2021 ; 1–23.
- [3] Al-Samarraie H, Saeed N. A systematic review of cloud computing tools for collaborative learning: Opportunities and challenges to the blended-learning environment. *Comput. Educ*. 2018; 124: 77–91.
- [4] Tottenham N, Shapiro M, Flannery J, Caldera C, Sullivan RM. Parental presence switches avoidance to attraction learning in children. *Nat. Hum. Behav*. 2019; 3(10): 1070–1077.
- [5] Gal MD, Borg WR, Gall JP. *Educational research: An introduction*. Longman Publishing; 1996.
- [6] Schreuder MC, Savitz RS. Exploring adolescent motivation to read with an online YA book club. *Lit. Res. Instr*. 2002; 59(3):260–275.
- [7] Nagy N. *Young Adult Literature in the Classroom: A Tool to Inspire Students and Encourage Reading Both Inside and Outside of the Classroom*; 2022.
- [8] McGinty JM. Accessible Digital Learning Materials for Inclusive Adult Education. *Adult Learn*. 2021; 32(2): 96–98.