

Development Of Interactive Wordwall Game Media To Introduce Healthy Eating Habits To Children In Group B At Ra Al-Amin Kotabaru

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Abstract

This study was motivated by children's limited understanding of healthy eating habits, evidenced by picky eating behaviors, a dislike for fruits and vegetables, and difficulty distinguishing between healthy and unhealthy foods. The limited range of instructional media used by teachers also highlighted the need to develop engaging and interactive media. This study aimed to develop an interactive Wordwall game, assess its feasibility based on expert evaluations, and gauge the responses of both teachers and children. The study employed the Research and Development (R&D) method using the 4D model (Define, Design, Develop, and Disseminate). The research subjects were children in Group B at RA Persatuan Islam Al-Amin Kotabaru. Data were collected through observation, interviews, documentation, expert validation, and product trials, then analyzed descriptively using percentages. Validation results showed scores of 95% from the subject matter expert (highly feasible), 77.08% from the media expert (feasible), and 97.5% from the language expert (highly feasible). Observations of children's activities yielded an average score of 93.33%, while the implementation of the media reached 100%; both were categorized as "very good." Teachers responded positively, and the children demonstrated enthusiasm and active participation in identifying and distinguishing between healthy and unhealthy foods. Thus, the interactive Wordwall game is suitable for introducing healthy eating habits to Group B children.

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1. INTRODUCTION

Early Childhood Education (PAUD) is a fundamental phase in the formation of lifelong habits, including eating patterns. During this period, adequate nutrition plays a crucial role in supporting children's physical growth and cognitive development. However, malnutrition and micronutrient deficiencies remain challenges to child development (Fitri et al., 2025). Low nutritional literacy is also evident in the tendency of children to consume only 1–2 types of food at each meal, with 96% choosing fast food and 81.48% preferring sweet snacks such as candy and chocolate (Kurniawaty, 2022). These conditions demonstrate the importance of introducing healthy eating habits from an early age.

Children aged 5–6 years are characterized by learning through play and need visual stimulation. However, the use of monotonous learning media can quickly lead to boredom and a lack of enthusiasm. Generation Alpha children need media that can stimulate multiple senses to maintain focus on learning (Gunawan et al., 2024). One digital media that can be used is *Wordwall*, which provides various interactive games. Game-based media can create a fun learning

experience (*joyful learning*) and increase children's engagement (Pradani, 2022). The use of Wordwall has also been shown to increase learning motivation through its competitive and fun gameplay features (Sari & Yarza, 2021).

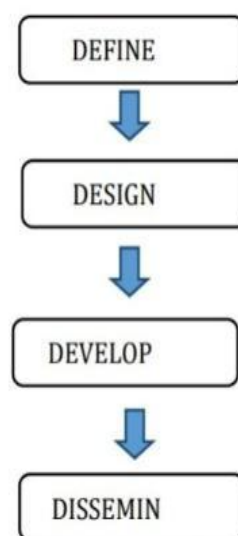
Based on initial observations at the Al-Amin Islamic Association (RA Persatuan Islam Al-Amin Kotabaru), communal meal activities through the Free Nutritious Meals (MBG) program have been implemented, but children's understanding of healthy eating still needs to be strengthened. Some children in Group B still exhibit picky eating behavior (picky eaters) and prefer low-nutrition snacks. A lack of engaging visual media is also a factor contributing to children's lack of interest in learning about a variety of healthy foods (Sari & Sujana, 2021).

This gap is reinforced by previous studies. An unsupportive early feeding environment has been associated with a higher risk of overweight and obesity in young children (Alberdi et al., 2016), while an authoritative parenting style has been linked to better eating habits in preschool-aged children (Harlistyarintica & Fauziah, 2020). Structured habituation programs have also been shown to improve children's consumption of healthy food (Amalia & Nurfadilah, 2021). These findings confirm that the problem of healthy eating habits in early childhood is well documented, yet interactive and developmentally appropriate media specifically designed to address it, such as the one developed in this study, remain limited.

Although Wordwall has been widely used in learning, this research has novelty in the development of content that specifically integrates healthy eating habit indicators into the game. Wordwall for Group B children. The media was developed according to the children's characteristics and the learning context at RA Persatuan Islam Al-Amin Kotabaru. Therefore, this study aims to develop an interactive Wordwall game media to introduce healthy eating habits to group B children at RA Persatuan Islam Al-Amin Kotabaru.

2. RESEARCH METHODS

This research uses the Research and Development (R&D) method with a combined quantitative and qualitative approach: quantitative data were obtained from expert validation scores and the media effectiveness test, while qualitative descriptive data were obtained from observation, interviews, and documentation. The development model used is the 4D (Four-D Model), which consists of: *Define*, *Design*, *Develop*, and *Disseminate* (Tegeh et al., 2014; Thiagarajan et al., 1974).



Gambar 1 Metode Research and Development model 4D

The research was conducted at the Al-Amin Islamic Association (RA Persatuan Islam Al-Amin Kotabaru), Karawang Regency, for six months during the even semester of the 2025/2026 academic year. The subjects were group B children aged 5–6 years.

The research instruments include observation sheets, interview guidelines, teacher response questionnaires, benchmark tests (*Criterion-Referenced Test*), RPPH instruments, trial record sheets, and documentation. Data collection techniques were carried out through observation, interviews, documentation, expert validation, and product trials. Validation data were analyzed descriptively and quantitatively using a feasibility percentage based on the scores obtained compared to the ideal maximum score, while data from observations and interviews were analyzed descriptively to describe the conditions, needs, and responses to the developed media. The expert validation sheets used a four-point Likert scale (1 = very poor to 4 = very good) with indicators tailored to each validator's area of expertise. The material expert's sheet assessed the accuracy and relevance of the healthy-eating content, its alignment with the learning objectives, and its suitability for children's developmental characteristics. The media expert's sheet assessed the visual design, navigation, ease of use, and technical functionality of the Wordwall-based game. The language expert's sheet assessed the simplicity, clarity, and communicativeness of the instructions and texts, as well as their appropriateness for early childhood language development. The observation sheet used comparable indicators to record children's engagement, understanding of instructions, and ability to distinguish healthy from unhealthy foods during the trial. The 4D model development procedure is carried out in four stages. First, *Define*, including front-end analysis, learner analysis, task analysis, concept analysis, and formulation of learning objectives to identify children's needs and characteristics. Second, *Design*, including the preparation of benchmark tests, selection of media and formats, and preparation of initial designs (*prototype*) for interactive game media Wordwall. Third, *Develop*, including initial product development, expert validation, product revision, and development trials with small groups of users. Fourth, *disseminate*, namely the distribution and application of products that have been declared valid and suitable for use in learning.

3. RESULTS AND DISCUSSION

This research resulted in an interactive Wordwall game media to introduce healthy eating habits to Group B children at the Al-Amin Islamic Association RA Kotabaru. The media development used a 4D model, which includes the following stages: *Define*, *Design*, *Develop*, and *Disseminate*. At the Define level, an analysis of learning conditions, child characteristics, healthy eating habits, and learning media needs was conducted. The analysis showed that children still need engaging and interactive media to help them recognize healthy foods, differentiate between healthy and unhealthy foods, and understand the importance of consuming nutritious food.

At the design level, the researchers compiled materials, indicators, and learning objectives, selected a Wordwall game template, designed the gameplay, and developed validation and user response instruments. The product was designed with the characteristics of 5–6-year-old children in mind, who enjoy play, images, colors, and direct interaction. The developed media included material on the benefits of vegetables, concepts, and the importance of learning. *Fill My Plate*, healthy food classification, and healthy food selection activities. The game uses several Wordwall templates, namely *Match Up*, *Group Sort*, *Quiz*, *Open the Box*, and *Maze Chase*.



Figure 2. Display of the interactive healthy food game

At the *Develop level*: The initial product was validated by material experts, media experts, and language experts, then revised based on the validators' suggestions before being tested on children. The final stage, *Disseminate*: This was conducted on a limited basis through the use of media in learning at the Al-Amin Islamic Association, sharing links with parents, and introducing the media to the Kotabaru IGRA PC. Distribution to the IGRA PC was solely for the purpose of introducing and providing access to the media, not as a research trial.

Wordwall Interactive Game Media Eligibility

Validation results indicate that the interactive game media Wordwall meets the eligibility criteria for use in learning. Validation was conducted by three validators: a material expert, a media expert, and a linguist. The assessment results showed that the material expert obtained a 95% rating, categorized as very feasible; the media expert obtained a 77.08% rating; and the linguist obtained a 97.5% rating, categorized as very feasible.

Validator	Percentage amount	Eligibility criteria
Subject matter expert	95%	Very Worthy
Media member	77,08%	Eligible
Early Childhood Language Specialist	97,5%	Very worthy

Table 1. Expert validation results

This suitability demonstrates that the material presented aligns with the learning objectives and developmental characteristics of children aged 5–6 years. From a media perspective, the game's display, design, navigation, and features are usable by children. Meanwhile, from a language perspective, the game's instructions are deemed simple, communicative, and appropriate for early childhood language development. The higher scores obtained by the subject matter expert (95%) and the language expert (97.5%) indicate that the healthy-eating content and the instructional language had already been closely aligned with the learning objectives and children's developmental characteristics from the initial design stage. The comparatively lower score from the media expert (77.08%) mainly reflects feedback on the choice of a website-based digital platform, which requires internet access and a supporting device, aspects considered less than optimal for the technological readiness of the research setting. This difference indicates that the feasibility gap stemmed from technical considerations related to the media platform rather than weaknesses in the content or language, and it was subsequently addressed through revision before the trial.

Although the media was deemed suitable, several improvements were made based on validator feedback. The content expert suggested using more varied, bright, and colorful images; the media expert provided input on the appropriateness of the use of website-based digital media for the designed concept; and the language expert recommended adapting the material to the child's age. This feedback served as the basis for product refinement before the trial.

Results of Media Trials on Children

After validation and revision, the media was piloted on six children in Group B. The pilot test was conducted to assess engagement, instructional comprehension, media use, and student responses during learning activities. Observations showed that all students achieved excellent scores, with scores of 100%, 95%, 100%, 90%, 90%, and 85%, respectively. The average observation score reached 93.33%.

No	Child's Name	Score	Percentage	Category
1	Kallea Citra Affandi	40	100 %	Very good
2	Kanaya Arina Balqis	38	95%	Very good
3	Chiquita Yumna Nurrijani	40	100 %	Very good

4	Novani Desi	36	90%	Very good
5	Alfred	36	90%	Very good
6	Abdul Hafiz Arrasyid	34	85%	Very good

Table 2. Percentage of children's observation results

The results showed that the children were able to pay attention to the teacher's explanations, understand the game instructions, actively participate, complete the game, and recognize and differentiate between healthy and unhealthy foods. They also demonstrated enthusiasm and enjoyment while using the Wordwall. These findings demonstrate that game-based learning can create a more engaging learning experience and be more suited to the characteristics of early childhood.

In addition to activity observations, pretest and posttest results showed an increase in children's average scores from 34.67 (86.67%) to 37.33 (93.33%), representing an increase of 2.66 points, or 6.66%. This improvement indicates a change in children's ability to recognize healthy eating habits after using the interactive Wordwall game.

Table 3. Results of the media effectiveness test

No.	Child's Name	Pretest	Posttest	Improvement
1	Kallea Citra Affandi	38	40	2
2	Kanaya Arina Balqis	34	38	4
3	Chiquita Yumna Nurrinjani	36	40	4
4	Novani Desi	36	36	0
5	Alfred	34	36	2
6	Abdul Hafiz Arrasyid	30	34	4
Amount		208	224	16
Rate-rate		34,67	37,33	2,67
Percentage		86,67%	93,33%	6,66%

The research results show that the interactive game Wordwall can be an alternative learning medium for introducing healthy eating habits to children aged 5–6 years. The high level of validation and child response indicates that the media meets the requirements of content, presentation, language, and usability. The presentation of material through food images, matching, grouping, quizzes, and maze games provides children with opportunities to learn through concrete and enjoyable activities.

The findings also show that the use of interactive media can increase children's engagement compared to learning that relies solely on verbal explanations and worksheets. Children were more focused on the activities, actively responded, and showed enthusiasm in completing the games. The trial results also demonstrated children's ability to recognize healthy foods, differentiate between healthy and unhealthy foods, and choose healthy foods for consumption. Thus, the research results support the use of interactive game media as a learning tool that is appropriate to the characteristics of early childhood. However, the results of the pretest-posttest improvement in this study should be understood as an indication of increased understanding in a limited trial, not as evidence of widespread effectiveness, because the study used a limited number of subjects. Overall, the developed interactive Wordwall game media is declared theoretically and empirically feasible for use in introducing healthy eating habits to Group B children at RA Persatuan Islam Al-Amin Kotabaru.

4. CONCLUSION

This research and development, conducted using the 4D model (Define, Design, Develop, Disseminate), successfully produced an interactive Wordwall game media to introduce healthy eating habits to Group B children at RA Persatuan Islam Al-Amin Kotabaru. The media was declared very feasible by the material and language experts and feasible by the media expert, and

its trial showed strong effectiveness, with children's activity observation reaching an average of 93.33% and media implementation reaching 100%, both in the very good category. Teachers and children responded positively, showing enthusiasm and an improved ability to recognize and differentiate healthy from unhealthy foods. The main contribution of this study lies in demonstrating that Wordwall's interactive game-based features can be specifically adapted to deliver healthy-eating-habit content for early childhood, offering an engaging and developmentally appropriate alternative to conventional nutrition education media.

5. SUGGESTION

Based on the research results, the suggestions that can be given are as follows:

For Early Childhood Education Teachers

Teachers are advised to optimize the use of interactive game media (*Wordwall*) in learning and provide guidance to children during the use of digital devices so that activities remain directed and focused.

For the Principal

School principals are expected to support the use of digital media by providing adequate technological facilities and integrating games like "*My Healthy Food*" as a supporting medium in activities to promote nutritious eating habits in schools.

For Parents

Parents are advised to accompany their children in using educational games at home and to strengthen healthy eating habits by providing a variety of foods, especially vegetables and fruit, in an interesting and fun way.

For Further Researchers

Further researchers are advised to develop research with a broader scope, such as measuring children's nutritional status or observing changes in eating patterns longitudinally, both in school and at home environments.

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