



Nutrient's Games: Evaluating the Impact of Interactive Media on Improving Nutrition Knowledge Among Students

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ABSTRACT

Child nutrition is important for children's physical and cognitive development. However, many children do not have a good understanding of child nutrition. Interactive media has the potential to be an effective tool to teach children about child nutrition. This study aims to determine the effectiveness of interactive media (Game Nutrient's Pocket) in improving students understanding of child nutrition. This study used a pre-experimental research design with a one-group pretest-posttest design. The participants of this study were a group of grade 1 to grade 5 elementary school students at SDN Kedungpedaringan II Kepanjen, Indonesia. The results showed that there was a significant difference in students understanding of child nutrition between the pretest and posttest. This means that the use of interactive media (Game Nutrient's Pocket) can improve students understanding of child nutrition. The findings of this study have important implications for the use of interactive media in education. Interactive media can be used to develop educational games and simulations that can help students to learn about various topics, including child nutrition. However, it is important to note that interactive media is not a magic bullet. It is important to use interactive media along with other teaching methods, such as lectures and discussions. In addition, it is also important to choose interactive media that is appropriate for the age and learning level of the students. Based on the results of the study, it can be concluded that the Nutrient's Pocket Game can improve the nutritional knowledge of students of SDN Kedungpedaringan II Kepanjen. This game can be an alternative learning media for nutrition that is effective and interesting for students.

KEYWORDS

Elementary school, Game, Interactive Media, Nutrients, Nutrition Knowledge.

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INTRODUCTION

Education is a key foundation for the growth and development of the younger generation. In this era of digitalization, the role of technology cannot be ignored in enriching children's learning experience (Dwivedi et al., 2019). One of the biggest challenges in education is ensuring that subject matter is presented in a way that is not only informative but also engaging for students (Mishra & Yadav, 2016). In this context, interactive media plays an important role in creating an engaging and effective learning environment (Alqahtani, 2019). Child nutrition is an important aspect of overall health and well-being. However, many children still lack adequate knowledge about nutrition. This can be caused by a variety of factors, including environmental factors, family factors and school factors (Lee et al., 2022). Environmental factors may include limited access to nutritious foods, exposure to unhealthy food marketing, and lack of opportunities for physical activity. Family factors may include parental knowledge about nutrition, dietary habits, and socioeconomic status. School factors may include the availability of healthy foods and drinks in the school environment, nutrition education programs, and physical education programs.

Learning media is one of the factors that can influence children's nutritional knowledge. Effective learning media can help students to better understand the subject matter. One of the effective learning media to improve children's nutritional knowledge is interactive games. Interactive games can make students more interested and motivated to learn. In addition, interactive games can also help students to understand the subject matter more deeply (Park and Kim., 2023). Interactive games have several advantages over traditional teaching methods. First, interactive games can better engage and motivate students. Second, these games can provide immediate feedback to students about their learning. Third, interactive games allow students to learn according to their own pace.

Based on the above background, this study aims to determine the effectiveness of the Nutrient's Pocket Games interactive game in improving children's nutritional knowledge in students of SDN Kedungpedaringan II Kepanjen. By combining elements of entertainment and education, this digital game seeks to transform conventional learning into an immersive experience, encouraging active participation and stimulating intellectual curiosity among students. The Nutrient's Pocket game is an interactive game that teaches children about nutrition in a fun and engaging way. The game features various activities, such as food sorting, quizzes and puzzles. The game is designed to help children learn about the importance of a balanced diet, different food groups, and nutrients that are essential for good health. As we embark on this exploration, it is important to understand the impact of interactive media on the cognitive and behavioral aspects of young students, which sheds light on its potential to revolutionize nutrition education in primary schools. The results of this study are expected to provide information regarding the effectiveness of the Nutrient's Pocket Games interactive game in improving nutrition knowledge in elementary school students. This information can be used by teachers and parents to choose effective nutrition learning media for their students. In addition, this study is also expected to increase public awareness of the importance of child nutrition.





MATERIALS AND METHODS

Research Design:

The research utilized a qualitative research design, employing structured surveys and interactive media intervention to assess the effectiveness of the Nutrient's Pocket Games in enhancing the understanding of child nutrition among elementary school students. Data collection techniques were carried out by means of observation, interviews and documentation studies.

Settings:

The study was conducted at Kedungpedaringan II Kepanjen Elementary School. The school environment provided the necessary infrastructure and participants for the research. The study was conducted in a classroom at Kedungpedaringan II Kepanjen Elementary School. The classroom was equipped with a computer and a projector.

Time Frame:

The study was conducted during one meeting for 20 minutes, on Saturday, October 21, 2023. We used this duration for the implementation of the interactive media intervention, data collection, and subsequent analysis.

Variables:

Independent Variables : Interactive media intervention (Nutrition Pocket Game)

Dependent Variable : Understanding of child nutrition among elementary school students

Population:

The population of this study were all students enrolled at SDN Kedung Pedaringan II Kepanjen during the study period.

Sampling:

A stratified random sampling technique was used. Students were divided into strata based on grade level, and then a random sample was drawn from each stratum. This ensured that participants from different grade levels were included in the study.

Structured Survey :

Designed to assess the baseline knowledge on child nutrition among the participants before the intervention.

Nutrition Pocket Game :

An interactive media tool developed for this study, which aimed to educate children about nutrition in an engaging manner.

Data Analysis :

Data collected from the survey and interactive media sessions were analyzed quantitatively. Descriptive statistics, such as mean and standard deviation, were used to summarize basic knowledge. Paired t-test or analysis of variance (ANOVA) was used to compare knowledge scores before and after the intervention, to evaluate the effectiveness of the interactive media intervention.





Ethical Clearance and Informed Consent: Prior to conducting the study, ethical clearance was obtained from the relevant ethical review board [specify the specific board/institution]. Consent was obtained from parents/guardians of participating students and the school. Participants were assured of the confidentiality and anonymity of their responses.

The research design allowed for a systematic evaluation of the effectiveness of the Nutrition Pocket Game in improving children's nutritional understanding among primary school students, providing valuable insights into the potential benefits of interactive media interventions in educational settings.

RESULTS AND DISCUSSION

Pre-Test Result

1st Grade

The pretest was carried out through short interviews with students. The pretest results are seen through observing students' responses to questions from the presenter. From the pretest, the results showed that the students had basic knowledge, they knew the names of food ingredients shown in the media. Students also know that these foods are examples of healthy food. However, they do not yet know the grouping of food ingredients based on types of nutrients. When delivering the material, students listen with focus. They interactively answer when delivering material interspersed with short questions.

2nd Grade

The pretest process is conducted by conducting a brief interview with the second-grade students. The second-grade students are not yet aware of the concept of nutrition and the classification of foods based on their nutritional content. However, when asked, they already recognize the names of foods and beverages from the pictures presented in the media. Based on the observation, during the material presentation, the second-grade students are highly focused on listening and understanding. They also enthusiastically respond to short questions provided. When learning took place with second-grade students, we used as light language as possible so that they could understand the material well.

3th Grade

The pretest is carried out through short questions and answers with student's. The pretest result are seen through observing student's responses to questions from the presenter. From the pretest result, it was found that student's had basic knowledge about nutrition, student's were also able to group types of food based on the nutritional content found in several foods. Then, when delivering the material, students are able to focus on listening to the material being presented. Then they were able to participate in the discussion enthusiastically and very interactively. They are able to mention examples of types of food and their nutritional content.

4th Grade

Pretest conducted in the 4th graders by holding a brief interview, all the student's answer indicates that they have basic knowledge about healthy and nutritious food, they also understand the nutritional components contained in food and drinks consumed daily. At the time of delivering the material, all





students paid good attention and carefully, it can be seen from the enthusiasm in answering the questions that had been raised by the speaker, the majority of them had known and were able to provide examples of healthy foods and the nutritional content contained in it.

5&6th Grade

Pretest conducted on grade 5 and 6 students by conducting interactive questions and answers, all student answers show that they have basic knowledge about healthy and nutritious food, they also understand the nutritional components contained in foods and drinks consumed daily but still do not understand the benefits of the various nutritional components. During the presentation of the material, all students paid attention well and carefully, but there were some students who were less focused and busy themselves during the presentation of the material.

Post-Test Result

By 1st Grade

Post-test results are assessed based on student's understanding when playing Nutrients Pocket. Based on the games played, the result was that all students could understand the material presented. On average, students can group food ingredients into appropriate types of nutrients. They can answer the benefits of carbohydrates, proteins, vitamins and minerals. The students are also very enthusiastic in participating in the nutrient's pocket game.

2nd Grade

The post-test results show significant improvement in the second-grade students understanding of the concept of nutrition and the classification of foods based on their nutritional content after the material presentation. They can now explain the concept of nutrition better and recognize the classification of foods based on their nutritional content. Their positive response and enthusiasm towards short questions also continue, indicating a better understanding after the learning. Their understanding was complemented by the Nutrients Pocket game. They were able to convey their understanding of the nutrients material contained in the foods in the Nutrients pocket.

3rd Grade

In the post-test session, almost all children were able to recall the food examples and nutrients contained in the learning materials. In fact, some children also managed to mention other examples of foods and their contents that were not listed in the media. This success demonstrates their deep level of understanding and their ability to apply this knowledge. This is not just an academic achievement, but also reflects the effectiveness of the teaching method and the children's desire to learn and understand the topic of food nutrition thoroughly. These results suggest that interactive learning approaches such as Nutrients Pocket have a significant impact on improving children's knowledge and understanding of nutrition and healthy food.

4th Grade

In the post test that has been submitted, it can be understood and remembered from their answers well so that when doing nutrient's pocket games, all groups can put all food and drinks correctly into bags that match the nutritional content contained. The majority of grade 4 children like fruits and vegetables but there is 1 child who is afraid to eat vegetables. Some of them every day there are also those who





bring provisions from home, but for their drinks they tend to like sweet packaged drinks sold at school rather than water.

5&6th Grade

The post-test results showed an increase in class 5 & 6 students' understanding of the concept of nutrition in food and the classification of food based on its nutritional content after the presentation of the material. They can now explain the concept of nutrition better and recognize the classification of foods based on their nutritional content. In fact, they can already mention and understand the benefits of the nutritional content in food for the body. Students' understanding seemed to increase when they saw the results of the Nutrients Pocket game.

The results of the discussion regarding the implementation of "Nutrient's Pocket" in the community service activities at Kedung Pedaringan II Elementary School, Kepanjen, Malang Regency, are as follows:

Nutrient's Pocket is designed as an educational game aimed at students in grades 1 to 5. The main concept of this game is to have students place nutritious food images into the nutrition bag that we have prepared. Each nutrition bag will be labeled with information about various nutritional contents, including protein, carbohydrates, minerals, vitamins, and other nutritional components.

The primary goal of implementing the educational game "Nutrient's Pocket" is to enhance students' understanding of balanced nutrition and inspire them to recognize nutrient-rich foods. More specifically, this goal includes transforming students who may have had limited awareness of the importance of nutrition into being better informed and developing their awareness of healthy foods. Additionally, the game aims to deepen their understanding of various nutritious foods and the nutritional content they contain.

In terms of design, Nutrient's Pocket will have easily accessible bag shapes for students. Inside, various food images will be provided, with each image representing a specific type of nutrient-rich food. Information about the nutritional content will be clearly displayed on each food image. The gameplay will challenge students to match food images with the corresponding nutritional content labels. This can be played individually or collaboratively among students, providing opportunities for healthy competition and teamwork.

In addition to food images, Nutrient's Pocket will also contain additional educational materials in the form of cards or other supporting materials. These materials will be used to explain the importance of nutrition in language appropriate for the understanding of students in grades 1 to 5. The role of teachers is crucial in the implementation of Nutrient's Pocket. They will facilitate the game, provide explanations, and answer students' questions. Teachers will also monitor the students' progress in understanding nutritional concepts.





The success of Nutrient's Pocket can be measured through pre-and post-game knowledge tests. Ongoing evaluation will ensure that students' understanding of nutrition continues to improve. Furthermore, this game can be integrated into the school curriculum to ensure that nutrition becomes an integral part of students' education. For further development, there will be considerations for integrating technology, such as mobile applications or e-learning platforms, to expand the reach of this educational game. Therefore, it is hoped that Nutrient's Pocket will make a positive contribution to achieving a better understanding of nutrition and nutritious foods among students at Kedungpedaringan II Elementary School, Kepanjen, Malang Regency.

CONCLUSIONS

In conclusion, this study exploring the effectiveness of the interactive media, Nutrient's Pocket, in improving children's nutritional understanding at SDN Kedungpedaringan II Kepanjen has provided valuable insights into the realm of gamified learning. The findings of this study provide a comprehensive understanding of the impact of interactive media on children's nutritional knowledge, as well as explaining its effectiveness in bridging the gap between theoretical knowledge and practical understanding. In line with our hypothesis, the results of this study firmly support the idea that interactive media, specifically Nutrient's Pocket, significantly improves children's understanding of nutrition concepts. The gamification approach successfully captured students' attention, making the learning process engaging and fun. The interactive elements in the game not only enhanced their theoretical knowledge of essential nutrients, but also translated into a practical understanding of healthy food choices.

In addition, the study also revealed new findings regarding the profound impact of game-coupled learning on students' motivation and participation levels. The interactive nature of Nutrient's Pocket not only increased their enthusiasm for learning, but also fostered a deeper interest in nutrition. This newfound engagement with the subject matter shows that integrating game-driven educational tools can fundamentally change the way children view and engage with nutrition education. supported the idea that interactive media, specifically Nutrient's Pocket, significantly improved children's understanding of nutrition concepts. In essence, the results of this study underscore the transformative potential of interactive media in educational contexts, emphasizing the need for a paradigm shift towards more engaging and participatory learning methodologies, which will ultimately enrich the educational experience for learners.

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Conflict of Interest

The authors declare no conflict of interest.

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