

Congklak Application To Increase Understanding The Concept Of Round Numbers In Elementary Schools

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Abstract

The purpose of this study was to determine students' understanding of integer concepts through innovative learning media. The method used in this research is Research and Development (R&D) research to produce a product. The Congklak application is designed by incorporating the traditional congklak game. This research was conducted at SD Negeri Sayung 1, Sayung District, Demak Regency. The product is designed through learning integer material using the context of the congklak game. The research stage consists of information gathering, planning, product development and product validation. The results of this study indicate that the Congklak application (Congklak.App) can be used to improve understanding of the integer concept. This is supported by the results of teacher and student responses as well as the results of the validation of experts showing very good criteria and suitable for use in learning integer concepts in elementary schools.

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Introduction

Mathematics is a universal science as the basis for the development of technology and science that plays an important role in various sciences. Good mastery of mathematics becomes the basis for the development of students' critical and innovative thinking skills (Sujiwo 2017). In fact, mathematics is still a subject that is feared by elementary school students. Some students also think that mathematics is a boring subject, because abstract mathematical concepts are difficult for elementary school students to understand.

Mathematics lessons in elementary schools learn about the basic arithmetic sciences as provisions for students to understand education at a more advanced level. One of the materials in mathematics learning in elementary schools that requires a clear understanding of the concept is the integer arithmetic operation. Based on interviews with teachers at SD Negeri Sayung 1, Kec. Sayung Kab. Demak, Central Java, in teaching integer concepts in elementary schools, teachers still use conventional methods. Teachers have not used learning media in the learning process. Therefore, students' understanding of the concept of integers is still an obstacle. For this reason, teachers are expected to be able to create an interesting and fun learning atmosphere (Sari et al 2019).

Regarding the learning activities of students who were sent home due to the special conditions experienced by the Indonesian nation and other nations in the world with the corona virus. So one of the steps that teachers need to take in increasing understanding of the concept of integers in elementary schools is through innovation in learning. According Yunus and Rezki (2020) that related to the development of the corona virus, the government finally made a policy as the first step, namely in the form of social distancing recommendations. This means that the government is fully aware that the transmission of Covid-19 is in the form of droplets of tiny mucus splashes from the walls of the respiratory tract of a person

who is sick, which comes out when coughing and sneezing. Therefore it is very important to realize together from all components of society not to carry out activities that mobilize many people in one place that is not too broad. Therefore, social distancing must be implemented in everyday life both in the work environment and in the household environment.

According to Latip (2020), the Covid-19 pandemic has a significant impact on various sectors, including learning. In order to prevent the spread of covid-19, the learning process is carried out with the Distance Learning system (PJJ). In the implementation of PJJ during the Covid-19 pandemic, technology with all its systems is the key to implementing learning that is able to translate into interaction, communication, teacher pedagogy and collaboration between teachers and learning that is blocked by distance. Android-based learning media is one of the determinants of the success of the learning process in this pandemic. Given the nature and habits of elementary school age children, they like to play. So the teacher is expected to be able to design and make learning media that includes elements of the game.

One of the games that teachers can use to develop all aspects of child development is the congklak traditional game which has been forgotten by many children due to modern games. According to Siregar (2014) that the game of congklak can be a means and media in learning mathematics to introduce the concepts of addition, subtraction, multiplication, and number division.

Based on this description, the researcher introduced learning media innovations based on traditional games of congklak that can be done by students at home independently, namely creating congklak into a medium to improve the concept of integers using android media or smart phones. According to Muyaroah and Fajartia (2017), the use of smart phones can have a huge impact on human life and provide a lot of convenience in its use. Currently, many applications are offered in one hand, making it easier to find the required information.

Research Methods

This research is included in the type of research and development (*R & D*) in testing a product. The product intended in this study is a traditional game model called Congklak using the application for android program designed for learning the concept of integers. The so-called development media modification is Congklak.App.

This study uses the Borg & Gall development model which consists of four stages. The research procedure carried out can be described as follows. The first stage of collected information using the interview method, questionnaire and documentation study. The second stage of planning, in this step, manuals and several journals, both international and national journals, are used as references in product development.

The third stage of product development. At this stage the researcher made a instructional media design with the following specifications: 1) Hardware for Authoring Courses CPU 2 GHz processor or higher (32-bit or 64-bit); 2) Minimum 2 GB memory, 3) Available Disk Space 1 GB minimum, 4) Display 1,280 x 800 screen resolution or higher, 5) Multimedia sound card, microphone, and webcam for recording narration and video, 6) Application file format / executable (.exe) or need installation, 7) The software used by Articulate Storyline 3 is a software that can be used to create interactive learning media, while the audio is edited or edited using Adobe Soundboth, 8) This media display size is designed in such a way that it can be run on laptops and on smart phones. This application

can be run on a computer with the help of the Mozilla or Chrome browser, while the smart phone specifications used must be on the Jellybean Operating System, 9) The mobile learning media is equipped with the main menu home, next, exit, help, back, restart, continue, as well as surprising music and sounds when answering questions in the game, 10) Mobile learning media is also available in my media menu, materials, simulation, exercises, evaluations, references, and profiles. In my media it contains manual congklak media, while the material contains procedures for using manual congklak media for operating integers consisting of addition, subtraction, multiplication and division, and 11) Congklak.App has interesting exercises or games, and evaluations where the value will appear after working on it.



The fourth stage of product design validation is carried out through expert judgment by several experts, namely IT media experts, material experts, language experts and practitioners. Each expert is asked to provide input and suggestions, so that weaknesses and weaknesses can be identified.

Sources of data in this study were obtained from fourth grade students and teachers at SD N Sayung 1, SD N Sayung 3, SD N Kalisari 3, and experts (media experts, linguists, material experts and practitioners). Data collection techniques in this study used observation, interviews, questionnaires, tests and documentation.

Data analysis techniques in this study are used to determine the need test for the product being developed. data was collected through data processing from qualitative data and quantitative data. Qualitative data obtained from the results of the pre-survey, observation results, interviews and documentation studies. Meanwhile, quantitative data analysis was obtained from product testing by experts through normality and homogeneity tests, teacher responses and student responses.

Results And Discussion

Digital technology has an important role in the continuity of Distance Learning (PJJ). Information and communication technology can help teachers to continue to control learning, evaluate learning, and eliminate learning problems that are limited by distance. Congklak Application Learning Media Innovations to Improve Understanding the Concept of Round Numbers in Elementary Schools has been implemented using the Research and Development (R&D) method. The results of the research include the results of preliminary studies of interviews with teachers, congklak learning media in the form of mobile learning, teacher and student response questionnaires and the results of validation of experts in their fields.

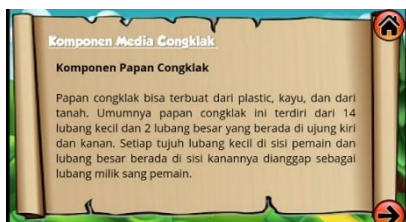
Interviews were conducted orally and online via google form to teachers and fourth grade students to find out opinions about the needs of instructional media. From the results of
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the interview it was concluded that the Congklak.App media was needed to improve understanding of the concept of integers. Based on the results of the teacher response questionnaire, the percentage of positive responses was 95% with the very good category.

The results of the calculation of student responses to Congklak.App media needs are 97.03% for the percentage of positive responses in the very good category. Validating is the activity of collecting data or information from experts in their field (validators) to determine the feasibility of a product. From the results of the assessment, all validators show very good criteria so that the congklak.app media can be used as a learning medium to improve the concept of understanding integers.

Validator	Total Rating Score	Maximum Score	Criteria
Validator I (Linguist)	27	30	Very good
(Material Expert)	49	60	Very good
Validator II (IT media expert)	58	70	Very good
Validator III (Practisi)	76	85	Very good

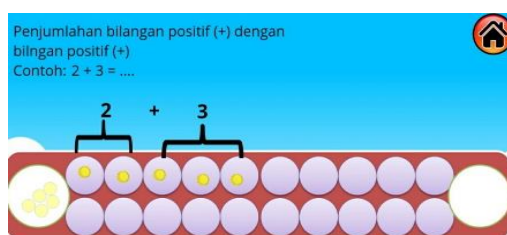
To access Congklak.App is very easy. Students can access Congklak.App by downloading Congklak.App, then install them in the Mobile or smart phone program. A smart phone is a mobile device equipped with an operating system like a computer. Smart phones can implement various forms of multi-media such as computers. The only advantage is that smart phones have high mobility and can be operated more effectively.



Congklak application is available in various menus, including my media menu. In my medium contains a description of the supercilious media. In my media, it contains a picture of the supercilious media component.



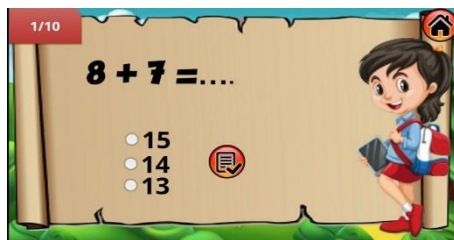
Furthermore, the material menu, which contains a guide on how to use congklak in learning integer concepts.



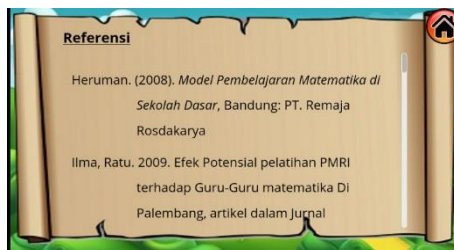
The simulation menu contains examples of how to implement congklak on the integer concept.

The training menu contains several practice questions in which there is audio music and if the answer is correct, then a voice can be heard. "It's cool I'm really answering this question". If the answer is salah, then a crying child will be heard.

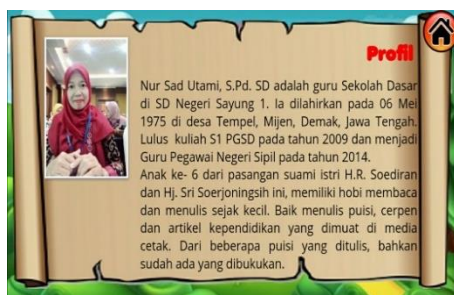
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The evaluation menu contains questions that must be completed by the user. This menu provides a touch sound and the questions can be done repeatedly.



The sixth menu is a reference, containing references in making the media.



The last menu is profiles, which contain biographies of media creators.

The research conducted has similarities with research by Rachmawati, Yakub and Renaldi (2015) which concludes 1) A basic mathematics learning program for grades 3 and 4 elementary school consists of 5 lessons and is equipped with sample questions, self-practice on each material, and practice questions. for all materials according to student grade levels, 2) Teachers can easily input student data, grades, absences, and make practice questions, 3) The implementation obtained is in accordance with the STD design. Furthermore, the research conducted is in line with Sylviani and Permana's (2019) research which concluded that GeoGebra has many possibilities to be used as a tool to assist students in getting an intuitive feeling and visualizing an adequate mathematical process. The use of this software allows students to explore different types of functions broader context, and provides students with making connections between symbolic and visual representations.

Conclusion

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The results of this study can be concluded that the application of application as an innovation in learning media to improve understanding of the concept of integers in elementary schools is really needed, especially during the Covid-19 pandemic, where the learning process is carried out using the Distance Learning (PJJ) system. Congklak.App as a learning medium that is able to explore interaction, communication, teacher pedagogy and collaboration between teachers and literacy and nationalist learning and independently of students. Students understand the concept of integers through Congklak.App which has been used for learning at home.

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