Using mathematics education game based ICT: why children like to play game?

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Abstract. The purpose of this study to create a product of learning media based ICT in the form of mathematics education games. Mathematics education games is a software to learn mathematic especially made for kindergarden to help learning process in 2013 curriculum. This research methode use design research with three cycles. In this cycle describe about six young childrens tested witht small group in research for the second step after literature review. The result of studyis got that by the issue of improvement in the process of presenting the game so it will improve the design and validity and it will be tested. Interestingly, the student didn’t relize that the process is math learning and the curiosity to solve the game is improve. The student never use this kind of ICT before. Next, by improve skill and knowledge that is got during the game as a strating point that will be continue to the other activity that center in the curiosity earlychildhood.

1. Introduction

Play game in electronic are popular not only among adults as well as early childhood. In happening, games as a basic human activity. Early childhood is everyday play games. Even results of our research show technology like computer game is the most frequent activity by early childhood and students [1]. Children start to use gadget in their early childhood. The consumer interest in video games since 1983. This suggest, it has been a very long time the development of this electronic game to develop until now and unbelievable, young people spend playing game gadget 6,5 hour in one days [2]. Technology can make contribution to early childhood if used weel [3]. However, the function of electronic game for process learning in class is potential like computer and mobile game. But the fact, the potential is not support by human resources and professional development[4, 5]. Computer games have been considered a useful tool to be employed for education [6, 7].
In Figure 1, it is can see illustration for early childhood and young people use gadget for play video game. The game is important for education children [2]. Early childhood game mathematics education is call mini game [8]. Early childhood game has a specific position activity in this period life. Using games in education must be effort children and important for their learning outcomes. Based on curriculum 2013 early childhood uses a thematic integrated which used a theme relate some subject so they meaningful experience [9, 10]. For learning mathematics early childhood can use electronic with simple software [3]. It can help early childhood to develop knowledge and skill for exploration and experimentation [11, 2]. Its can also be used for gaining conceptual understanding of, relation and strategies [12,13].

The aspect of game is cognitif, motoric social, diagnostic, motivational, imaginative and creative [14]. In mathematics, before children get first formal mathematics they have already to built up a considerable amount of knowledge [15,16]. The mathematical knowledge is constructed in response to daily life experience. RME or Realistic Mathematic Education is approach to constructed knowledge children with using context daily life to support learning process. Giving children context daily life will help them to like mathematics in accounting. Indonesia has many country. The game using pempek as context in mini games. The research use mini game with presents information and gives back. Early childhood can develop competence skill as accounting and sorting with drill and practice software [17]. The aim of this research to make product computer mini games for early childhood and to know why the young students like to play game with gadget.

2. Method

Design research method is used in this research with three phases of the preliminary design, the design experiment, and retrospetive analysis [ 18, 19]. Data collection techniques used were video recording, photograph, student interview during learning. This research was conducted in Dharma Wanita Kindergarten, Pagar Alam, Sumatra Selatan. In this school has support learning for ICT. The result in this article describe at the phase design experiment in particular in a pilot experiment. The three participant in this case with different capability for subjects research. In preparation the research and teacher choose problem relevant with curriculum 2013, with expert and validator together design for mini education games. The research and teacher give instruction for the participant to learning with electronic game has designed before.
3. Result and Discussion

Before being tested in the small class, researcher with expert and teacher designed the game for mathematic learning by paying attention to the thematic curriculum 2013, the theme chosen was loving the homeland, the component in this theme is so complex which relates to the other learning material, respecting, sharing, and knowing the number which relates to the traditional food. Pempek is traditional food from Palembang which made from processed fish and very popular among children and adults. The various geometric shapes made Pempek very interested by the children, there are small tube shaped and round circles.

This research focused on the content of counting and sorting. Before beginning the counting learning, the children were given the knowledge about the story of pempek which was the delicious and nutritious traditional food. It related to the starting point in PMRI (Pendidikan Matematika Realistik Indonesia) as the introduction that related to the daily life experiences. Daily life context could help children in understanding the learning, it became easier to be imagined [20]. These following parts gave knowledge to the EGP game (Education Game Pempek) which was showed in figure 2.

![Figure 2. The picture of giving information to the children](image)

Figure 2 shows the picture of giving information to the children about the traditional food from Palembang which is very popular. It is very important in thematic curriculum 2013 that relates from one learning to others. In this stage, there was element of loving homeland by introducing the popular traditional food, delicious and highly nutritious. After giving the initial knowledge about the traditional food, the next stage was giving the game of counting all of pempek, this stage was a part of counting learning, the description of pempek counting game can be seen in figure 3.
Figure 3. Game of counting pempek. If the children chose the correct answer, they would get star point that could be added continuously until the last star. When the children were asked to begin count pempek, the reaction was so enthusiastic. They always listened to the teacher’s instruction and count the total number of pempek on the mobile phone. Children should feel enjoy during the learning process.

Figure 4 shows that the children counted the pempek in the game, the children showed their fingers based on the total of pempek in the picture. There was no obstacle for children in completing this game, but the teacher gave a suggestion to add other activities after counting. It was important to make children not stock in the electronic monitor. The next game was sorting pictures game. This game asked the children to sort the pempek from the smallest to the biggest.
Figure 5 shows the game of sorting pempek shapes from the smallest to the biggest. This sorting game made the children thought in completing the questions by paying attention to the smallest shape first.

Figure 6 shows the children were so serious in completing and thinking the pempek shapes, this research stage showed that there were still some children who felt confuse in completing the game. So, they asked for a help from the teacher. After the interview, the researcher found that the most difficult game was the sorting game. It was caused by the children’s confusion in sorting to the number, right hand lane and left of pempek.

The electronic game is very interesting, it could be seen from the testing in the classroom, the children were so enthusiastic in using mobile game, by using the EGP game (Edukasi Game Pempek), the children did not feel playing while learning, the children liked this game because the pictures were so interesting, the pempek picture was so often seen by the children, the delicious and nutritious food was so suitable for children in introducing stage in learning. Besides pictures, the children liked to play game because there was a challenge to complete the problems, when the problems were solved, they would feel very happy and wanted to try the other games. The star point as the reward in EGP game
also gave the children an appreciation so they felt appreciated in completing the problems that had been solved by themselves.

**4. Conclusion**
This EGP game is really help the teacher in learning process and also very practical to be applied. The children were very enthusiastic in completing the tasks in the EGP game. This game in the further research could be a basic material for making other activities in completing the obstacles in the game. Although, the most difficult game is sorting game, the children still completed it. The interesting pictures and sounds in the game make the learning process becomes more enjoyable. The researcher hopes that this research could be continued as the material in research that relates to the designing the material based ICT for early childhood.

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