Random and match game for education purposes with model learning technology system architecture

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Abstract. Education in Indonesia still faces various problems and challenges in teaching and learning process both internal and external factors such as props, media and also implementation of information technology. The use of multimedia-based learning media in the learning process will help students to understand the material to be delivered. Random and match is a game consisting of 4 different games that are addressed to kindergarten children to know the use of technology positively in learning process, and by applying Model Learning Technology System Architecture learning an utilization using computer will be more useful for teacher and kindergarten students.

1. Introduction
Learning process is the integration of teaching and learning activity[1–4]. The teaching process is the delivery of information from the knowledge facilitator to the acceptor[1,5]. In addition to being a conveyor of information to students, the learning facilitator is also a regulator of the learning process and the environment in the classroom[5,6]. Media on Learning is one example that can be utilized to improve the efficiency of learning process, because it can overcome many things such as communication, passive students and also less specialized learning object without media help.
Random and Match is a game that can improve the ability of players to remember the shape and sound of the objects that exist in the game, generally this game is used for children aged 5-7 years in growth, especially on child memory and can be developed to the level continue to sharpen memory. The application of Learning Technology System Architecture (LTSA) [7-9] in the game is used as a standard to accommodate the learning processed by using software. In addition to applying the LTSA concept to prototype game, the use of randomizing and searching algorithms [10–14] in games makes the game better, especially in the object of game section for each level.

Function games as a learning media does not guarantee the user would be more smart or have more ability to absorb material in accordance with the research of Clark (1994)[15] and Kozma (1994)[16], but by using the game as the media learning it would become more interesting because the material is provided in the form of games, in this paper the game prototype recognizes objects intended for children. The game is expected to provide a media for learning to children aged 5-7 years.

2. Methodology
The learning model used in this article uses the concept of LTSA [7] with the modeling as in Figure 1 below:

![Figure 1. LTSA Diagram Model](image-url)
Figure 1 presents the general concept of LTSA on the application of technology in the field of education, there are several steps taken to implement LTSA in education learning.

a. Define the problem.
b. Opportunity and Approach from applying game as educational media.
c. Analyze the problems that exist, and then put in the material to be made into the form of educational media visualization.
d. Development of educational media by focusing on solutions of learning problems.
e. Testing is done in 2 stage with each test on educational media material and usage of user

Random and Match game created is the initial prototype of more complex games, the type of game on the prototype created specifically to introduce the object to the user especially children, such as:

a. Matching Objects
b. Matching Voice
c. Matching Numbers
d. Memory Match

Some type of game is the initial prototype of the game created by applying LTSA as a model of application of games as educational media.

3. Result and Discussion

The prototype random and matching game created then tested to some users to find out the feasibility of the game and get feedback from the users, figure 1 are some screenshots from prototype random and match game.

![Figure 2. Screenshot Prototype Game](http://science.conference.upi.edu/proceeding/index.php/ICMScE/issue/view/3)
Figure 2 is a screenshot of a prototype that is designed with each component of the object will appear randomly because of implementing randomization algorithms in the game, comment and suggestion from user as in table 1 below:

**Table 1. Comments and Suggestion from Game as Educational Media**

| No | Suggestion and Comments |
|----|-------------------------|
| 1  | The objects on the game are exciting and well-liked by children |
| 2  | Learning using game is very effective to use and interesting. |
| 3  | Learning in the form of games makes the material more interesting and fun |
| 4  | The animation is pretty smooth. Trying to make an application like this with different material. |
| 5  | Game materials that are randomly displayed make students more interactive in solving game challenges |

Learning media in the form of games used by students and assisted by teachers to explain the material is considered quite well with a positive response from teachers and users. Based on the assessment results can be concluded that the developed learning media meet valid qualifications.

4. **Conclusion**

The concept of LTSA on Random and Match games produces an interactive game because the delivery of material is made in the form of game material that is interesting and easy to use, for kindergarten students' learning while playing game was fun. The game is still in the form of prototype and it so much can be done improvisation such as by applying Augmented Reality in educational game and many others.

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