



Developing a health education game for preschoolers: What should we consider?

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Abstract

Objective: To provide a comprehensive picture of what preschoolers prefer in computer game so that such game may be developed as a medium in health education. This is an important step to attract the children's attention so that the learning objectives from the educational game can be achieved.

Method: This study used descriptive qualitative approach and involved seven children aged from three to six years. Purposive sampling was used to choose participants in accordance with the inclusion criteria. Participants were also chosen on the basis of whether they had good communication skills based on evaluation by their teachers. Data were collected through interviews and observation of types and models preferred by preschoolers followed by the analysis process using the Colaizzi method.

Results: Research showed there were three characteristic features of games preferred by preschoolers: 1) main character was preferred to be a moving creature, contain elements of fantasy, and have an attractive appearance; 2) game model was favored when it involved activities and rewards, and 3) the use of bright colors, particularly primary and secondary colors.

Conclusions: To develop an appealing game for preschoolers, features such as the main character, activities in the games, and bright colors should be considered.

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Introduction

Preschool is a good period for children to learn at their full potential. This period is instrumental in the formation of concepts and constant ideas. Applying an important concept in this period will help develop a child's mindset at a later date. Preschoolers may learn through play activities. Along with the rapid development of technology, the type of game preferred by preschoolers today is the computer game. Children aged 2-7 years spend an average of 3-5 hours in a week playing

video games¹. In Indonesia, children spend an average of 1-2 hours per day, twice a week, playing computer games².

A game is an activity that helps children achieve full physical, intellectual, social, moral, and emotional development. Games can help children—particularly school age and preschool children—improve their learning ability³. They are also effectively used as a health promotion approach to improve health behavior in children⁴.

Educational games are effectively used in improving linguistics⁵, mathematical logic⁶, and for motivating preschool-

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ers to learn new skills⁷. A game is a device that teaches its users to learn how to solve problems and get the best solutions⁸. Game-based learning requires active participation from the players to experimentally make decisions and solve problems, which stimulates analytical thinking, synthesis, and evaluation⁹. The initial step in providing education to change behavior is to seek and gain the desire to learn⁴.

The active participation of a player is mainly determined by the player's interest in the game and the player's ability to learn from that game. Therefore, the first step to provide education to preschoolers through game-based learning is to design a game that appeals to the target group of its players. Considering the potential of gaming as one of the strategies to teach health education to preschool students, this article contains a description of the type of game favored by preschoolers as an input in designing an effective game for education.

Method

For the purpose of this study, a descriptive qualitative approach was used to obtain more comprehensive information from the children. The study was conducted in two kindergartens in South Sulawesi. Participants were boys and girls from 3 to 6 years and able to play Android-based games. In total, there were seven participants. Informed consent was provided by parents or guardians. Only children with permission from parents or guardians served as participants. Participants were chosen purposively. They were selected by the teachers based on specific criteria as well as their communication skills. Data were collected to obtain saturated data.

The guidelines used in interviews were compiled by researchers and validated by experts in Early Childhood Development, who reviewed how to gather information from preschool children. Before conducting research, permission was gained from the Research Ethics Committee of the Faculty of Nursing at the University of Indonesia.

Data were collected through face to face interviews and observation of gameplay. Instruments used during the interviews were a cell phone voice recorder to record the information from participants, a pen and a notebook to make field notes on the observations of non-verbal responses of participants during gameplay. Data were analyzed using Colaizzi by identifying meaningful information through the coding process, organizing data into themes or categories, writing memos, and performing data interpretation or analysis.

Results

Based on the purpose of this study, three themes emerged related to the games: appealing characteristics of the main character, game type, and the use of bright colors.

Characteristics of the main character

In this study, participants revealed that the highlight of the game was the appealing main character. A good character would be a creature or moving object; it could contain ele-

ments of fantasy, and it should have an attractive appearance. Creatures or moving objects could be animals, people, or forms of transportation. The last option of transportation was only mentioned by the boys.

"[...] birds [...] Hello Kitty... and Minnie Mouse" (Ad).

"eeee hmmm Sophia... because she is a princess" (Rn).

"What is your favorite thing in a game? Train and cars" (Nf).

"Other than airplane, is there any other thing you like in a game? An airplane in a car" (Fb).

The preschoolers also conveyed that a main character was appealing if it contained elements of fantasy. Elements of fantasy preferred by preschoolers were special power or strength and game presentation in the form of cartoons or animation.

"What is so good about Bima? He can turn into robot" (Fb).

"[...] I took his power, so he was not strong enough to beat me" (Nf).

Another thing favored by preschoolers in a main character of a game was an attractive appearance. Nice clothes and accessories and a distinctive style were mentioned as elements of an interesting appearance of a main character in a game.

"What is so good in that game...? The people, and also the clothes" (cNf).

"What do you love from a princess? Her crown... her clothes and animals" (Rn).

Type of game

Characteristics of game types favored by preschoolers included activities, gifts (rewards), and in-game variety. Activities preferred in the form of gameplay were activities such as nurturing or caring for the main character, objects or color matching, coloring, shooting, drawing, taking orders, and anything that involved a rush of adrenaline.

"There is a game in my mother phone about taking care of babies who cry after being put down" (At).

"[...] Any other games you like? Cooking games..." (Ny).

"What type of game you like to play? Game consists of running" (Nf; Ir).

"Usually there are taking order games whereas we take order from the visitor of the restaurants. We have to match the color of the visitors" (Rn).

An observation was made that, out of four games chosen by the boys, three of them were shooting activity games... (Fb; Nf).

Preschool children also expressed a preference for in-game gifts (rewards). These could be either trophies, novelties or high scores in the game. Preschool children get easily bored and therefore enjoy a variety of games. Here are a few phrases from the participants:

"He really wants to have the trophy fast. If he gets 9000, he can get the trophy" (Ir).

"What is so good about football game? To get new people/players" (Nf).

Results from the observation team revealed that, on average, children played three types of games within 10 minutes.

Selected color

Another interesting aspect of a game is color. Participants revealed that they favored bright colors: primary colors and

a mix of basic colors (secondary colors). Pink and purple were mostly preferred by girls, while red, yellow, blue, and green were favored by both boys and girls. The following are a few quotes from the participants (the words underlined are key words):

"If it's about color, what colors do you like? Pink with purple, and blue with red" (Rn).

"What colors do you like? Red, blue, and green" (Nf).

Discussion

The main character preferred in a game is a creature or moving object, contains elements of fantasy, and has an attractive appearance. The main character is one of the key factors that attract children to a game. If the main character is interesting, children will try to play the game. Thus, this is an important consideration in the development of educational games for children as gaining their interest is one of the initial steps to delivering educational information⁴.

Preschoolers also tend to favor funny and cheerful characters¹⁰. In this study, preschoolers aged 3-5 years also demonstrated a preference for imaginative content with informal elements and elements of fantasy¹¹. Imagination provides the opportunity for preschoolers to experiment with decision-making and problem-solving under risk-free conditions⁹. This creates a pleasant learning environment for children and stimulates their thinking.

In developing a game for preschoolers, there are four things to consider: clear and consistent game instructions, a challenging learning environment, game control options, and an attractive appearance. Making a game visually attractive involves the background design, animation, and audible and proper sounds¹². An appealing game will increase a child's interest in learning and, consequently, stimulate active cognitive learning.

Preschoolers evaluate a game based on the type, the variety of activities, and the availability of gifts and rewards. Preschool is the period in which children learn quickly. Children have a great curiosity and want to know how things work¹³. Preschoolers also have psychographic characteristics such as high activity levels and high curiosity. They are delighted to be involved with something new and have high creativity¹⁴. Preschool children are contented with imitative, imaginative, and dramatic games in which they have time to express themselves¹¹.

Preschool children are generally given games for cognitive development¹⁰. In providing education to preschoolers, four components are needed to build effective learning: audio visual instruction, interaction, termination, and positive reinforcement¹². Positive reinforcement is important in the development of educational games to increase motivation in children, particularly intrinsic motivation. Increasing intrinsic motivation will motivate the children to keep playing and learning, so they are absorbed in the story of the game. Children who continue to play will get to experience active learning and therefore improve their ability to analyze, synthesize, and evaluate situations through the game⁹.

Preschoolers prefer bright colors from the primary colors such as red, yellow, and blue, and the secondary colors, which consist of green, orange, purple, and pink. Infants

and children prefer to learn through visually appealing, colorful, interactive, and real objects, rather than just through textbooks and audio¹⁵. Video games with bright colors, enticing background music, and an attractive appearance will significantly increase a child's interest in learning. This will result in the child becoming attached to the game and obtaining the messages delivered through the stories in the game. The more interested children become in the game, the greater their desire to learn; thus, the game further increases their motivation to learn¹⁶.

A game favored by preschool children is one that has an interesting main character, various activities, a promising gift or rewards, and a brightly colored display. Further research regarding educational game development, especially for preschool children, should consider the points favored by children in a game in order to attract that user group and achieve the game's intended educational goals.

Conflicts of interest

The authors declare no conflicts of interest.

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