Anthropomorphic Character on Prototyping Cognitive Video Game for Preschoolers

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Abstract

Selecting a game character becomes an essential consideration in game design, and even more in a game designed for preschoolers. Game character is one of the several key parts from a game component recommended by pediatric development expert to be appropriately designed in a game, since game character could bring positive or negative influence for a preschooler as its user. The primary objective of this paper was to analyze types of suitable characters liked by children from the perspective of both pediatric development experts and children themselves. The method applied in this study was recommendation result evaluation and analysis of pediatric development experts. Moreover, it collaborated survey result of children preference for game characters. Based on the evaluation and analysis result, the most suitable game prototype design for preschoolers was anthropomorphic character based on both the recommendation from experts and the children's preference for the game characters.

Keywords: anthropomorphic, game character, anthropomorphism, preschool, cognitive video game

1. Introduction

Prototype design for a computer game should consider things that could be a necessity or part of that game [1]. Moreover, for cognitive video games intended for preschoolers, it certainly needs more attention on the content [2] and its user interface (UI) [3]. The content and UI of video game consist of several components. One of them is the character from the player in it. This game character is essential since it has a significant role in technically and emotionally controlling player in a video game [4].

This game character role is used by game designers in influencing players emotionally [5] so that the main purpose of this game can be well achieved. This is very effective when it is applied in serious game type such as the video game for preschoolers [6], as discussed in this study.

Lankoski, in his work, states that game characters could influence and even invoke a sense of player's sympathy and antipathy through positive and negative attitudes laid by the game character [7]. Additionally, a well-designed game character would enhance player immersion toward role-playing game played; thus they could animate the mission from that game [8].

A video game designed with social life content [9] and with the appropriate game character can provide social life perspective for the players and their decision making. It can even create a player character with the image they played in the game [10], either

positively such as for education and therapy [11] or negatively [2] such as violence [12]. The motivation to perform something can also be improved through game represented by the game character, or commonly known as avatar [13].

The selection of game characters becomes the very significant thing in determining whether it is interesting in either UI (visual) [1], [14] or content. Therefore, this study discussed how to choose a suitable character for a cognitive video game, especially for a preschooler.

2. Method

This study used game concept development method in the part of requirement analysis [15]. It modeled game character determination based on the survey result of children's (as user) preference tendency toward game character using pediatric development expert opinion regarding it, or commonly known as usability survey [16]. This study was a collaboration between experts in pediatric psychology and game design [17] that resulted in the appropriate and suitable game character recommendation for children in the game that was designed specifically for a preschooler.

The more detail spelling out regarding the line of thought in this study can be seen in Figure 1. The study was initiated by preparing documents to perform survey [5] and expert judgment [3]. The survey was conducted on objects, which were preschooler or early childhood 4 – 6 years of age or preoperational [18], and they recognized game through gadget such as, computer, smart phone, tablet, or game console. The study objects were 24 preschoolers in a kindergarten. In this activity, the children were asked to choose the character figures various game characters (human being, animals, dolls, abstract (imaginary), vehicle, and foods) from various cognitive video games arranged randomly, this process was repeated 12 times [19] each for three times taking.
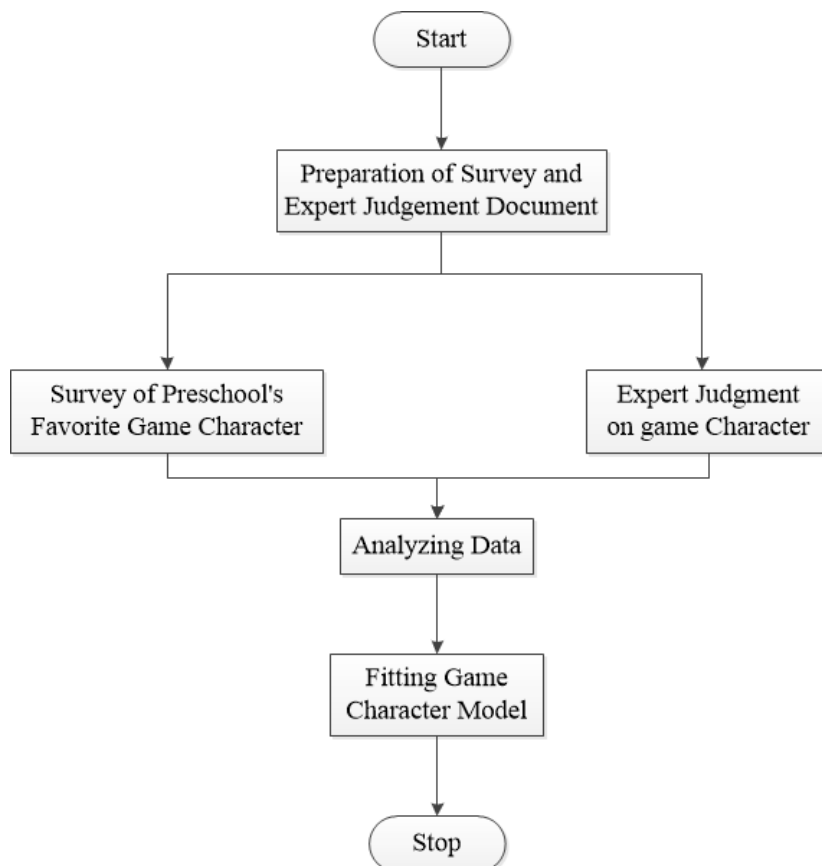

Figure 1. Research Flowchart

On the other hand, the experts who would be asked for recommendation were psychologist having expertise in pediatric development as well as ICT (information and communications technology) development observer for children. These study objects were six psychologists who quantitatively and qualitatively provided input and recommendation for the content (children's cognitive components: egocentric, animism, time concepts, mental representations, and magic) [20] and technical gameplay from the designed game.

After the survey result data and expert judgment were obtained, an analysis was performed to bring together both of their fundamental principles. The analysis result was used to generate a game character with appropriate characteristic and role-play for preschoolers. These results could be applied/considered in a cognitive video game for preschoolers/early childhood designing process.

3. Results and Discussion

3.1. Results of Preschool's Favorite Game Character

The main result of this stage was obtaining the children's preference tendency on a game character. This result revealed that children tended to like game character other than human being (animals, dolls, imaginary, vehicle, and foods). Figure 2 shows that 91% of the children chose the game character other than human, while only 9% of them chose the human character. Among game character other than the human being favored by preschoolers, the most preferred character was imaginary and followed with animals, with the percentage of 25% and 23%, respectively.
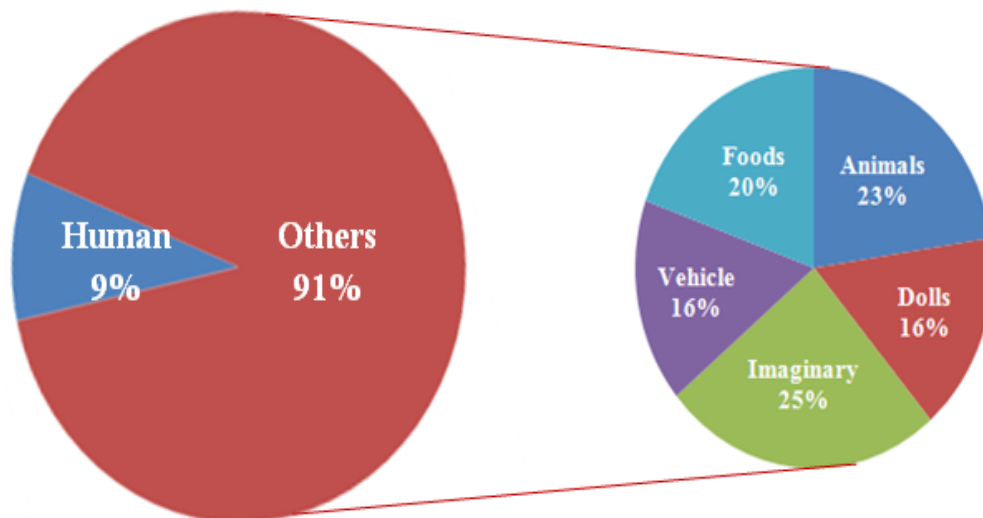

Figure 2. Trend of Preschooler's Game Character Preference

The analysis of children's favorite shows that they tended to like game character other than human being and more specifically, they tended to want imaginary (imaginary and abstract figures, for example alien, zombie, etc.) as well as animal figures. However, the game character still has control over its role-play in the game as the avatar of the player in a cognitive video game [21]. This role-playing game is also related to the children's psychological character that must be available in a cognitive video game specifically for preschoolers. This will be discussed later in the next subsection.

3.2. Experts' Recommendation of Important Component of a Game Character

Experts suggest that in designing a cognitive video game for children, the game developer must consider ten key components, which are: character, graphic/visual, audio/music, storyline, game scenario, background, level, challenge, reward, and language. Among them, three key components with the highest rating were the game scenario, character, and storyline. The final rating result is presented in Figure 3. Although the game character was not the component with the highest rating; these three elements had a nearly similar rating, which means that they were considered as significant aspects of designing a cognitive video game for preschoolers.
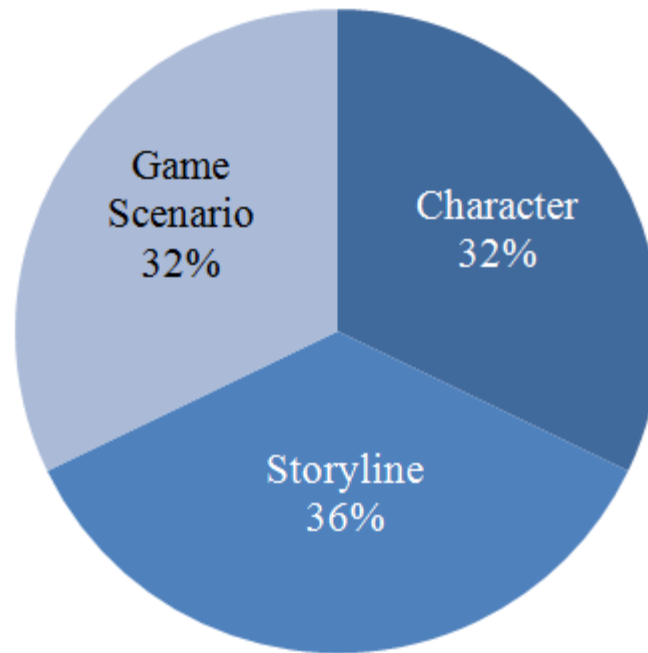

Figure 3. The Three-highest Components Necessary in Constructing a Game

Experts also provided input regarding children's cognitive components: egocentric, animism, time concepts, mental representations, and magic, in which their results are presented in Figure 4. 33% of the psychologists suggested that animism component must be available within cognitive video game design, and followed by egocentric that was recommended by 21% of the psychologists. This shows that animism and egocentric were prioritized in cognitive video game design, which could be visualized in game character.

Animism character is a game character with the form of an inanimate object that moves and speaks like living creature. Piaget explains the observation and interaction when children made a statement that related animation characteristic for nonliving thing [22], where the belief in animism exists due to the children inability to separate themselves from the world.

Subsequently, egocentric is a concept where children could not observe things from other people perspectives. In the preoperational stage, children receive new knowledge and information, and they try to adjust everything with the information they have [23]. As the children's experience is limited, they only look at the information available inside themselves.
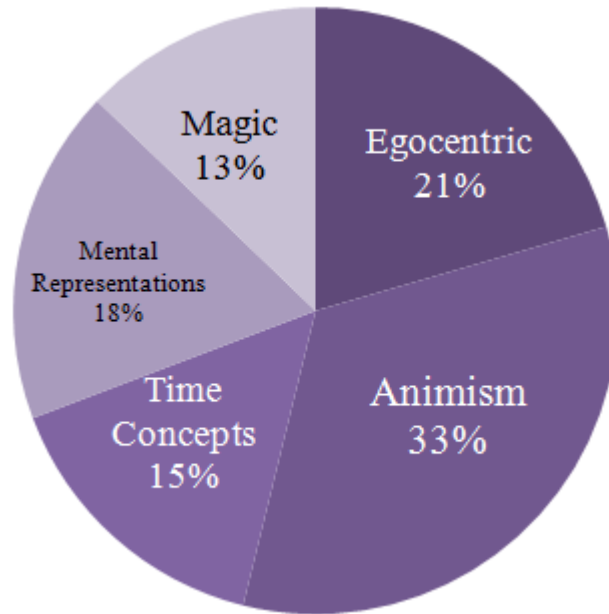
Figure 4. Preschoolers' Cognitive Concepts Recommended by the Experts

A game character having animism and egocentric features could be modeled as an avatar (imaginary objects or animals) rather than human, and it has full control role-play like the human. This definition is commonly known as 'anthropomorphic character' terminology on a video game.

Anthropomorphism is an attribution of human motivation, characteristics, or behavior to inanimate objects, animals, or natural phenomenon, and these can be related to a phenomenon in animation [24]. This is very appropriate for the game character that would be expected as a non-human figure (included in animism category); however, it has a very humanistic egocentric character [25].

The incorporation of survey results on children preference tendency and expert recommendation could be used in designing a game character that is specific and suitable for preschoolers/early childhood development. The suitable model is the one having non-human, animism, and egocentric features. The detail of its analysis thinking line could be explained in Figure 5. The model that was the most favored by children and recommended by psychologists was the anthropomorphic character.

4. Conclusion

Based on the explanation and analysis results as mentioned above, the majority of preschoolers preferred to have a game character that was not a human being, with the number reached 91%. Moreover, the psychologists suggested animism component as the most recommended cognitive component that must be available within cognitive video game design by 33% rating, followed by egocentric with 21%. It could be concluded that in designing game prototype for preschoolers, the anthropomorphic character could be applied since it is suitable for children development condition. This is supported by the children themselves who favored this character type.
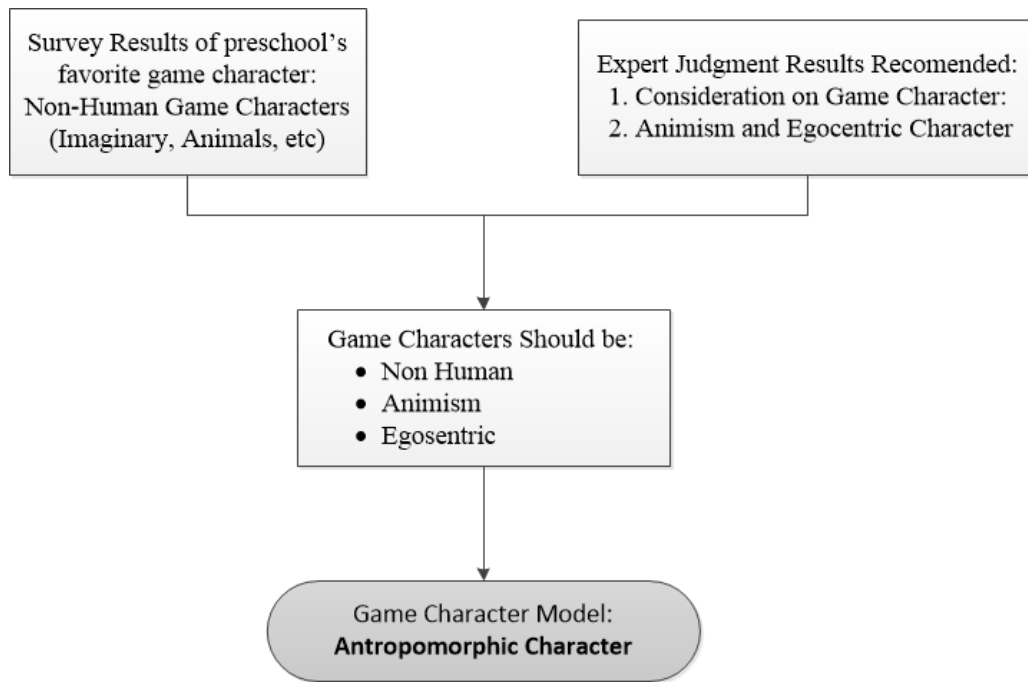
Figure 5. Analysis Framework

Acknowledgments

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