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## ARTICLE

## RESEARCH ON THE INTERACTION DESIGN OF DRAWING GAME APPS FOR PRESCHOOL CHILDREN

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## ARTICLE DETAILS

## ABSTRACT

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Many children's drawing game apps on the market do not meet the needs of children and parents very well. Based on the characteristics of children's development, this paper explores the interaction design method of preschool children's drawing apps. Firstly, the psychological and physiological characteristics of preschool children are analyzed with the theoretical support of child development psychology, and then the interaction design of children's art drawing game apps is taken as the object to analyze the current situation of preschool children's art drawing game apps and propose the interaction design method applicable to preschool children's drawing game apps. This paper proposes the applications of adapting the interaction of preschool children's art painting game app to meet the optimization of the interaction design method of preschool children's art painting applications in the way of art-assisted education. Provide development ideas for more apps suitable for preschool children.

## KEY WORDS

Preschoolers, Interaction design, Drawing games, Child development psychology

## 1. INTRODUCTION

With the development of the Internet era and the popularity of mobile terminals, many parents choose to use the drawing game app on iPad and electronic drawing board as their children's drawing enlightenment. However, the existing painting games in the market have a single mode and do not have the interactivity for children, which cannot meet the needs of children and parents well. This article will explore the psychological and physiological characteristics of children aged 3-6 for preschool children, and explore the ways and means of interaction design in the drawing game applications suitable for this group of people, so as to better meet the needs of preschool children's age group. At the same time, using relevant theories as support, such as Piaget's cognitive theory in child development psychology, the interaction design framework for preschool children's art drawing game apps is summarized by analyzing and summarizing the development and needs characteristics of preschool children. Quality education includes art education, and art education assists children's education. A large number of studies have proved that drawing has a relatively important initiation significance for preschool children, and almost all children are born with an interest in drawing, which functions similarly to language for children and is an important means for children to understand and communicate with the world [1]. Most of the existing drawing game apps mainly focus on doodling and coloring, ignoring the interactivity in the game. Only some interactivity aimed at the interests of preschool children can better attract children's attention. This paper takes preschool children as the research object, studies the interaction design principle of drawing game app, has positive guidance for children to use drawing game app, and proposes the interaction design method

to better optimize the drawing game app design method to meet the developmental needs of children.

## 2. USER DEVELOPMENT CHARACTERISTICS OF PRESCHOOL CHILDREN

## 2.1 Art Development Characteristics

Drawing is a favorite activity of children, and it can be said that drawing is the nature of children. When preschool children have not yet developed their language system, painting is an important tool for them to express themselves and understand the world. American educator Ron Field divides children's art development into six stages. Preschoolers are mainly in the scribble stage (2-4 years old) and the schematic stage (4-7 years old), during which they are forming their own perceptions of the world and obviously have different psychological needs when drawing than other age groups [2]. Children's drawings during the scribble stage go through a process from messy line scribbles to controlled scribbles to named scribbles, in which children gain practical experience. Children in the schematic stage show strong self-centered tendencies when observing things and begin to make some symbolic depictions of things [3].

## 2.2 Psychological Development Characteristics

Children's mental development is influenced by external and internal emotions and can be highly uncertain. According to the theory of child psychologist Piaget, children's cognitive system goes through four main stages, of which preschoolers are in the preoperational stage. The

characteristics of children in the preoperational stage in this period are mainly: children can use representations instead of actions to think about objects and events, and their thinking will be more agile and flexible, which will be limited by egocentrism, will be more focused on intuitive states, and will lack flexibility [4].

Children of preschool age are growing and developing rapidly, and are moving toward greater maturity and improvement in body structure and physiological function. In terms of vision, preschoolers' visual acuity has basically matured and they have a basic ability to discriminate colors, shapes and colors. Studies have shown that in color recognition, children tend to prefer colors of higher brightness and purity, and bright colors are more likely to be favored by them. In terms of hearing, preschool children have a well-developed level of hearing and can accurately identify the size and timbre of sounds, as well as locate the source of the sound. In terms of tactile sensation, preschoolers can perceive changes in the external environment and the touch of objects through tactile signals during this period.

### 3. ANALYSIS OF THE NEEDS OF PRESCHOOLERS FOR INTERACTION DESIGN

Preschoolers enjoy using games for behavioral learning and communication practice, and they learn a great deal about cognition and communication collaboration from a variety of games [5].

Games are an indispensable form of entertainment for children's growth, and they are also the main carrier and form of expression for interactive design of children's educational apps [6]. The drawing game app mainly realizes interaction through the communication of system information and the feedback of children's users. The drawing game app transmits relevant information to the children, and the children respond and give feedback to the app after receiving it.

As the user subject of the drawing game app, children's interaction with the app is mainly reflected in the interaction of senses and emotions. The sensory interaction of preschool children is mainly visual, auditory and tactile, and the interactive environment of the drawing game app is created through the sensory interaction channels of visual, auditory and tactile. At the same time, the imagination and curiosity of preschool children are very strong, so when designing the interaction, it is more important to pay attention to the emotional interaction, by choosing the appropriate way of drawing games and sensory interaction, so that preschool children can trigger emotional interaction and communication when using the drawing game app.

Therefore, when designing the interaction of preschool children's drawing game app, we should first pay attention to the emotional interaction between preschool children and the app, and then complement each other through the combination of senses and emotions, so that the drawing game app can be closer to preschool children users, they can more effectively promote brain and physical and mental development when using it.

### 4. EXPLORING THE INTERACTION DESIGN OF A DRAWING GAME APP FOR PRESCHOOL CHILDREN

Nowadays, with the development of electronic digital technology, the same type of drawing game software is also emerging, but at the same time, the user's awareness of independent choice is also constantly increasing. Therefore, in this case, it is very important to increase the attractiveness of the app for children, which requires analysis of the methods of interaction design implementation when designing the drawing game app.

Children of different ages have different requirements for drawing game apps. This paper mainly analyzes the developmental characteristics and needs of preschool children, and summarizes the following three methods of interaction design for preschool children's art drawing app.

#### 4.1 Perceptual Design Methodology

The perceptual design methodology of the preschool children's drawing game app mainly emphasizes that the child user can exercise the coordination of various perceptual organs when using the app, so that it can improve the preschool children's physical coordination and the

ability to perceive the outside world. When designing a drawing game app, you can increase the appeal of the app to children by shaping the experience from different senses and stimulating the child user to create an intrinsic response when using it.

#### 4.2 Interesting Design Methodology

Interest is a common commonality in children's product design. Children's nature is to "play". The best learning state for preschool children is to learn while playing, and the drawing game app also perceives the charm of painting through games. Only when the learning content is interesting and rich enough will it engage preschoolers, stimulate their interest in learning, and lead them to take the initiative to learn. The drawing game app for preschoolers can attract children's interest through a multi-sensory interactive approach. According to the psychological characteristics of preschool children, they generally prefer interesting cartoon images, bright colors and interesting moving pictures. Therefore, when designing a drawing game app, you can use a multi-sensory interactive approach and use elements such as animations and colors that preschoolers love as content carriers so that preschoolers can find new points of interest.

#### 4.3 Guided Design Methodology

Preschoolers are at the beginning of their lives, their thinking skills and attention span are also developing at this stage, which is crucial for their future growth. Guide the development of preschool children's imagination and attention through the interaction between preschoolers and drawing games. At the same time, preschool children of different ages have different drawing characteristics and their needs for drawing game apps will also be different. Therefore, the rules of children's development must be followed. For example, children's drawing games can be designed according to the drawing characteristics of children of different ages. Under the entertainment needs of preschool children using the painting game app, it can also make them have a different feeling of painting when using it.

### 5. CONCLUSION

This paper takes preschool children as the target research object, firstly analyzes the characteristics of children's art development, psychological development and physiological development, then analyzes the needs of preschool children for interaction design, and finally summarizes several interaction design methods for preschool children's drawing game app based on the above analysis. These are: the perceptual design methodology, the interest design methodology and the guided design methodology. With the development of the Internet, mobile digital products are used more and more frequently, more and more parents choose to use the drawing game app as children's drawing initiation. Education is very important for children, and art also assists education. Therefore, it is also of great significance for children's education to do a good job in the interactive design of the painting game app. There is still a long way to go in the future of the drawing game app. When designing in the future, we must fully respect the psychological and physiological needs of children and combine the constantly updated new technology to explore more suitable personality development strategies for children. It can also provide new development ideas for more apps suitable for preschoolers.

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