

Research on Parent-Child Product Design Based on Interaction Theory

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Abstract: With the continuous change of educational concept, parents pay more and more attention to the relationship between parents and children. Coupled with the impact of the epidemic, staying at home has become a new life mode, which makes the contact between parents and children closer. The emergence of parent-child products has become a bridge between them and their children. However, the existing parent-child products still focus on the child and do not fully take into account the interactive experience of parents. Based on the Interaction theory, this paper analyzes the current situation of parent-child products and combines it with the Interaction theory explore an innovative two-way circular interaction mode, so as to provide reference for improving the quality of parent-child products.

1 INTRODUCTION

In recent years, parent-child education has attracted more and more attention from parents, and many parent-child products have come into people's sight. In the current epidemic stage, family members have more communication opportunities and contact space, which makes parent-child products favored by parents. At present, there are many kinds of parent-child products on the market, but their interaction mode is relatively single, and most products can only allow children to participate, while parents can not integrate well, lack of interaction and communication experience, resulting in narrow content of parent-child interaction and unable to provide a good communication platform between parents and children (Su 2020). In view of this problem, this paper makes an in-depth analysis of parent-child products by using Interaction theory, makes an innovative design of parent-child interaction methods, and explores a two-way circular interaction mode that meets the demand points of parent-child products at the present stage, so as to effectively improve the relationship between parents and children.

2 OVERVIEW OF INTERACTION THEORY

2.1 Concept of Interaction Theory

Interaction is the behavior of interaction and connection between objects. This process needs two or more objects to realize (Hu 2020). Life is full of interaction everywhere. Through interaction, we can better convey and exchange information, and better enhance the emotion between people.

Interaction theory first appeared in social psychology, and its research content is the relationship between people's community and psychology in society. Later, it was first applied to the field of Industrial design in design, which is called "Interaction Design" (Zhou 2021). When Interaction theory is combined with design, it becomes Interactive design. The key of Interactive design lies in the interaction between people and products, which aims to enhance users' experience of using products, Good interactivity can give the product temperature, make it more in line with people's emotional needs and meet people's expectations.

2.2 Application of Interaction Theory in Parent-Child Design

The main purpose of parent-child products is to enable parents and children to communicate and interact effectively (Meng, Li, 2019), so interaction is particularly key in the whole product experience process. When users use the product, they are actually interacting with the product (Zhu, Liu, 2014), Parent-

child products are based on the interaction between parents, children and products. In order to realize the benign interaction between parents and children, it is necessary to explore an appropriate way of interaction. The determination of the way of interaction is based on the daily living mode of parents and children and the behavior characteristics of children themselves. Different types of interaction bring different physiological and psychological feelings to parents and children, as shown in Tab.1.

Table 1 Comparative analysis table of different types of interaction

Interaction type	Parental observation type	Parental guidance type	Parent-child co-participation type
Interactive mode	Children interact with products and parents watch	Interaction between children and products and guidance from parents	Parents and children use the product together
Physiological and psychological analysis	Physiology: exercise the children's own operation ability Psychology: only children communicate with the product, and parents fail to feel the interaction	Physiology: when children interact, they learn more knowledge through the guidance of their parents Psychology: when children interact with products, they also communicate with their parents	Physiology: children operate with their parents and cooperate with each other Psychology: both parties fully feel each other's company and communication through the joint use of products
Functional analysis	Improve children's learning ability without considering parents' feelings	After parents' guidance, children learn knowledge and increase their feelings with their parents	The joint participation of the two sides has greatly deepened the emotional exchanges between parents and children
Characteristic	Only children participate	Children's participation and parents' guidance	Children, parents and products form a two-way circular interaction among the three

According to the above analysis, it can be found that the joint participation of parents and children can bring the best interactive experience. Based on the concept of Interaction theory and guided by the joint participation of parents and children, parent-child products can be divided into three two-way interaction modes of mutual circulation and mutual influence, as shown in Fig.1. The three interact and influence each other, in which parent-child products act as a bridge to assist the cultivation of family relationship between parents and children. In this interactive way, we can maximize the role of the product for parent-child users, so that both parents and children can get the best sense of experience.

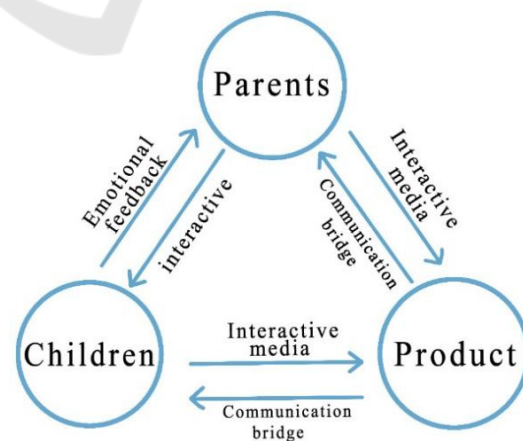


Figure 1 Interactive cycle process diagram

3 RESEARCH STATUS OF PARENT-CHILD PRODUCTS

3.1 Definition of Parent-Child Products

Parent-child products refer to products based on parent-child relationship, in which parents and children participate together and interact through language, behavior and emotional communication (Zhang 2018). The users of parent-child products are both parents and children. Children are the main users of parent-child products. The identity of parents is the participant who can communicate with children. Through the communication and interaction between parents and children, children can feel the love from parents, so as to improve their feelings. Parent-child products take parent-child relationship as a bridge and interaction as a means to make parents and children better understand each other's needs in the process of interaction, so as to achieve the common development of parents and children (Fan 2016).

3.2 Current Situation of Parent-Child Products at Home and Abroad

With the continuous improvement of social level, parent-child education has been paid more and more attention by parents, so a variety of parent-child products with different styles have sprung up into our lives (Sun, Wang, 2015). In the epidemic stage, people's home time has been increased accordingly, which also increases the heat of parent-child products.

The development of parent-child products abroad is more mature, the market development is relatively perfect, and more attention is paid to the concept of parent-child education. For example, a series of parent-child Board Games launched by Orchard Toy, a famous early childhood educational toy brand in the UK, not only enrich and fun parent-child time, but also play a very good role in early childhood education, as shown in Fig.2.

Compared with foreign countries, the development of domestic parent-child products is relatively late. In the early stage, the main research direction is to focus on the role of parents on their children. Most parent-child products still focus on the mode of "children first and parents second". The quality of products is also mixed, and the significance and influence of two-way interaction and two-way communication between parents and children are not really taken into account. Now it is gradually

changing to the direction of parent-child interaction and cooperation based on two-way interaction (Pan 2021), and the design angle is biased towards the aspects of interest, interaction and security, especially the common experience of parents and children has been greatly improved, For example, the product design of N · FUN parent-child interactive furniture designed by domestic designers skillfully combines furniture and interesting games, and realizes the common sense of use experience and interest of parents and children. As shown in Fig.3.



Figure 2 Orchard Toy early childhood Toy brand



Figure 3 N·FUN parent-child interactive furniture

3.3 Category of Parent-Child Products

In recent years, the popularity of parent-child products has been rising, and there are countless product types in the market. In the face of different types of parent-child products, they can be divided into the following four categories according to their nature of use, Parent-child daily necessities products include: parent-child furniture, parent-child parenting back bags, etc.; Parent-child education products include: early education toys, parent-child identification cards, etc; Parent-child toy products include: parent-child building blocks, parent-child board games, parent-child puzzles, etc; The most common products of parent-child outdoor products

are baby carriages, as well as parent-child tents, parent-child bicycles, parent-child outdoor facilities, etc.

4 INTERACTION THEORY IN PARENT-CHILD PRODUCTS

4.1 The Importance of Interaction Theory in Parent-Child Products

Good interaction is the key to the communication between people and products. Through the Interaction theory, two-way interaction is introduced into parent-child products to truly achieve a good interactive environment suitable for both parents and children. Based on the research of Interaction theory, it is necessary to add some actions that need the cooperation of parents and children in the way of interaction, so as to increase the degree of interaction between parents and children. At the same time, it is also necessary to consider the experience of the form of interaction for parents and children and improve the participation of parents and children (Cai 2019).

4.2 User Demand Analysis of Parent-Child Products

As the core element of parent-child interaction, children's user characteristics are of great significance to the development of design. 3 to 6 years old is the pre-school or early childhood of children's development. This period is the key period of children's physical and mental development. Therefore, it is mainly analyzed for children in this period (Wu 2014). At this stage, children's intellectual development is very fast. At the same time, they will be full of curiosity and interest in new things. Their language and action abilities will also be greatly improved, and their plasticity is very strong. Therefore, pre-school children are the best period for parent-child training. This period can cultivate children's learning interests and hobbies with the fastest and best quality.

Another user group of parent-child products is parents. The characteristics of parents are different from children. They have perfect senses, independent thinking and can well accept the new things produced by social development. At the same time, parents are

facing some pressure from work, and parent-child products can be used as a good tool and means for them to relax.

Therefore, in the process of parent-child design, while fully considering the needs of children and allowing them to get a full interactive experience, the needs of parents should also be considered accordingly. The product should have a certain decompression ability and be able to use it for interactive communication between parents and children for a long time.

5 PARENT-CHILD PRODUCT DESIGN PRACTICE BASED ON INTERACTION THEORY

5.1 Using the Design Concept of Interaction Theory

Combine the basic elements of Interaction theory with the needs of parent-child products, take two-way interaction and parent-child joint participation as the starting point, adhere to the product design principle of "people-oriented", exchange more roles in the design, give parents and children the opportunity and space to play together from the perspective of users, and integrate them into parent-child products in the form of interactive games by adding some interesting and educational elements, Simplify the rules of the game in the product and let parents and children cooperate to complete an interactive mode in which game, interest and education coexist, so as to achieve the role of teaching in fun and comprehensively enhance the emotional relationship between the two sides.

5.2 Product Design Scheme

Using the interactive design principle, the design scheme adopts the well-known form of "Whack-a-mole game", the overall shape is the image of "elephant", and the upper end is 8 openings; The elephant's tail is a manual handle; The mouth is a drawer that can be opened and closed, in which a small wooden hammer for beating moles can be placed; The ear part has two sound outlets. As shown in Fig.4 and Fig.5.

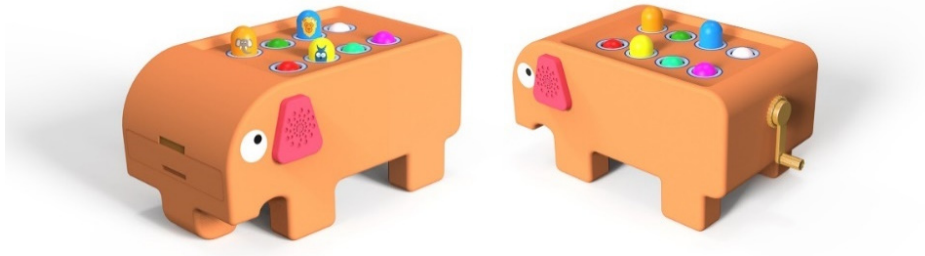


Figure 4 Final renderings

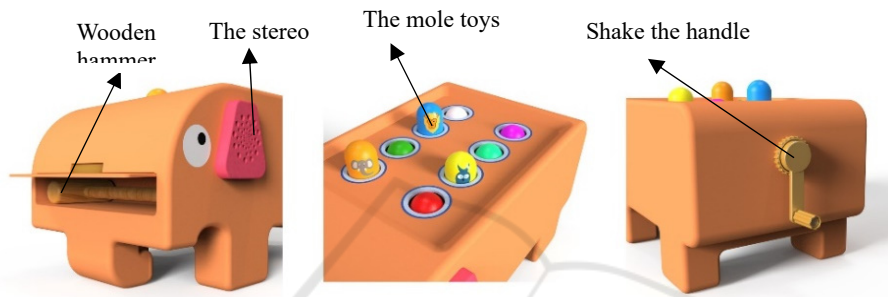


Figure 5 Product detail drawing

5.3 Instructions for Use of Design Scheme

Different from the traditional form of Whack-a-mole game, it adopts the way of manual out of the mole. When used, one of the parents controls the mole out of the hole by shaking the handle. The faster the rotation speed of the handle is, the faster the mole out of the hole is. Children hit the mole with a small wooden hammer, and both sides can fully participate. Similarly, parents and children can exchange positions for games. In addition, each gopher has different colors, and each mole has different animal patterns, which can enable children to recognize colors and learn the knowledge of various animals in preschool. This parent-child product provides two ways for parents and children to interact, so that parents and children can enhance each other's feelings and shorten the distance between them in the process of playing games. As shown in Fig.6 and Fig.7.



Figure 6 Man machine relationship diagram



Figure 7 Usage scenario diagram

6 CONCLUSION

Parent-child product design based on Interaction theory has very important practical significance in today's parent-child education and parent-child relationship training. With the development of modern life, a variety of parent-child products have spread to the daily life of every family. Using this innovative two-way interaction in parent-child products can effectively and accurately grasp the needs of users, design parent-child products that can really cultivate emotions, give parents and children the best interactive experience, and meet the needs of modern parent-child relations, and make parents and children meet their spiritual needs.

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