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Interactive design method for children's table screen

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Abstract: With the introduction of the national double reduction policy, the needs of children and parents have become diversified. Especially, traditional children's picture books can no longer meet the learning and living needs of contemporary children, and the cross-media development of children's books is the general trend. In children's reading scene quality began to improve the situation, interactive children's books on the table screen will also lead the tide. Table screen interaction will increase users' sense of reading experience by changing the way users read. Its significance lies in placing picture books, cards or other products related to the content of children's books in front of smart devices, and using auxiliary devices to convey users' interaction behavior between the desktop and the books to the smart devices. Through image processing technology, users' fingertip operation, painting, page turning and other behaviors can be identified to present another scene on smart devices, bringing users a more immersive learning experience.

Keywords: Interaction design; Children's table screen; Reading.

1. Introduction

At present, the research reference and related products of interactive design of children's table screen based on image processing technology are relatively few. In the domestic children's intelligent books products, the point reading pen is the most popular product. The point-reading pen can make the way of children absorbing knowledge more vivid and interesting through scientific and technological means, and it has become the most popular mainstream early education product at present. Point-reading pen collects the contents of picture books through its camera and uses digital image processing technology to identify the contents of picture books, which can read out the contents of picture books for children and increase children's immersive reading experience. In children's books on the table screen interaction, the game dissolved in education, more can arouse children's interest.

As for the interactive design products of children's table screen based on image processing technology, osmo series, plugo series and other products have begun to appear abroad. With the help of intelligent mobile devices and image processing technology, the interactive connection between mobile applications and paper and desktop has begun to be realized. Such children's educational products are all foreign products. Tian et al. [1] believed in their research that educational games are an effective way to promote learners' own development and learning experience. Using intelligent technology, educational games can stimulate learning interest, strengthen interactive participation, improve learning efficiency and provide an immersive learning environment. In the era of integrated media, interactive children's books on the table screen include game experience. However, in China, children's products related to tablet-screen interaction have not been well known and widely used, which leads to a lack of research.

With the advent of the intelligent age, the level of image processing and interaction technology is gradually improved, and more and more interactive means begin to emerge in the market. Including the application of interactive technology to children's books, also become a trend of The Times.

In terms of interaction design, Thomas et al. [2] conducted a study on the integration of interactive reading into children's classrooms and indicated that this intervention could achieve better development in the future.

Thinking from the perspective of children, Mokhtar et al. [3] mentioned that one of the important experiences for pre-school children is for children to pick up paper and pen to fill in color, in order to practice and express creativity. In the era of new media, interactive children's books are becoming a hot topic in publishing, and new ways of reading children's books are affecting children and children's books.

From the perspective of interactive books for children, Miller et al. [4] said that the reading mode is rapidly shifting from print to screen, and many children experience literacy through internet portable apple device and other handheld digital devices. In terms of the domestic market, children's education apps such as hong eun literacy, baby bus and zebra artificial intelligence class have emerged and gained a large number of users. Backgambit, cattle listen, vigorously learning light and other products began to transition to the interactive direction of the table screen. Picture book reading is the enlightenment reading for children. With the advent of the Internet era, picture book reading is no longer just traditional paper reading, but APP reading has become the mainstream. The form and content of children's education have undergone great changes, information and humanized education is imperative.

The advent of the information age and the rise of digital products drive the progress and transformation of all walks of life. The popularity of intelligent mobile phones and tablet computers has made traditional paper books challenged by electronic reading. Because children are exposed to children's books at an early age, the design of children's books will have an impact on children's physiology and psychology.

Thinking from the perspective of children's physiological development, Wasik et al. [5] compared the influence of interactive reading materials on the literacy of children, and proved that interactive reading materials can better promote the development of children's literacy. Merga [6] came to the conclusion that interactive reading would have social and emotional impacts on children.

From the perspective of children's psychology, Gu [7] pointed out that in the process of the continuous improvement of living standards and consumption level of Chinese residents, every family attaches particular importance to the growth and education of children. However, the quality of children's education products in the current market is different, and there are few products that can truly meet the needs of children.

2. Existing problem

Through the description and analysis of the above existing technologies, the existing research on interactive design of children's table screen based on image processing technology mainly has the following three problems:

First, against the background of informatization trend, interactive technology has been applied to various fields, including children's book industry. The integration of interactive means into children's books has a variety of positive effects on children's physiology and psychology. However, when smart devices become the new favorite toys of children, the problems brought by electronic products also gradually emerged, including preschool myopia, addicted to games and other adverse effects.

Second, at present there are few children's interactive reading products about table screen interaction at home and abroad, and relevant researches are not enough. Parents of domestic users are not familiar with products related to interaction with desk screen technology. When parents become more and more picky about children's books, they do not know what products can help them solve their problems. Related research methods are mostly limited to survey, reference and other methods, which restricts the depth of research.

Third, from the perspective of children's physiology and psychology, the combination of children's books and smart devices is bound to become the trend of the future under the environment that children's books need to fit users' reading behaviors and meet users' various needs. While allowing users to pick up a pen and return to traditional paper books, the combination of the current trend electronic devices and the use of augmented reality technology and other interactive means is bound to become the trend of the future. Improving users' reading immersion is one of the ways to meet the multiple needs of current users, and it is also the focus of theoretical and practical attention. However, the current interaction design practice and related research do not meet the development needs.

3. Contents

Traditional children's picture books have been unable to meet the learning and living needs of contemporary children. In the context of improving the quality of children's reading scenes, interactive children's books on the table screen will also lead the trend. Table screen interaction will increase the sense of reading experience by changing the way users read, and bring users a more immersive learning experience. Therefore, based on the background of media integration, this paper explores the research on the interaction design of children's books on table and screen, and finds out the compatibility between table and screen interaction and children's books, so as to provide new ideas for the cross-media design of children's books, explore the characteristics of the combination of desktop and intelligent devices, and strive to broaden the multi-faceted interaction of children's books, and exercise children's hands-on ability and imagination. Further optimize children's picture book reading experience. By enhancing the interactive experience between children and books, it deepens the connection between children and books, and also makes children's books have profound meaning. Specifically, the research significance mainly includes the following four aspects:

3.1. Current situation

In the digital age, the design research of children's books is not a new research direction, but the interactive children's books on the table screen are not well known by the public. With the improvement of children's and parents' requirements for reading and learning picture books, the cross-media design of children's books is imminent. Picture books are the type of books with the highest contact rate in children's early reading. Under the general trend of the popularity of interactive design, interactive children's books begin to emerge in an endless stream. Sorting out different interactive experience design will help to study the interaction design of children's books in the future.

3.2. Analyze the influencing factors of interaction design

From the original simple thinking of "things" began to think about the relationship between "things and people". Effective interaction design enables children to perceive the characteristics and attributes of products and generate corresponding experience feelings, which will directly affect children's psychology, emotion and thinking, and guide children's interaction with products. This paper analyzes the influence of different interaction modes on children's physical and mental development through the analysis of design factors at the functional level, action level and emotional level, and takes the conclusions as the main basis for improving interactive children's books.

3.3. Improve the interactive method and optimize user experience

After sorting out the problems of the current situation, analysis of solutions, design children's books in line with the physical and mental characteristics of modern children. The development of digital technology undoubtedly has a great impact on children's education industry. How to prevent children from becoming addicted to electronic devices has also become a concern of parents. In the context of improving children's reading experience, the design of research products should avoid excessive reliance on electronic devices, which has practical research significance. While making use of the more interesting and vivid educational experience brought by modern digital technology, they do not abandon the cultivation of practical ability brought by traditional paper reading, which is also the new demand of children's parents at present. How to improve interaction, meet new needs and optimize user experience has become the most important research significance.

3.4. Provided references for the style

In terms of the current domestic market, digital children's books are in a period of rapid development. Through the design of one or two interactive children's books products, the limitations of the existing design of children's books will be improved, so that the reading of children's books will be

transformed from low-level entertainment education to high-level interactive experience, and a children's book product style with certain reference value will be formed. In front of the development trend, to provide reference for the future development of children's books under the media.

4. Methods

Through four aspects, that include reference research method, questionnaire survey method, case comparison method and experiment method, the user experience research of children's interactive technology is explored. The specific four methods as follows.

4.1. Reference research method

In the early stage of the study, consulted and sorted out a large number of relevant research reference about the principles, elements and technical support of interaction design applied to children's educational applications, that including monographs, textbooks, papers and online publications on how to apply interaction design to children's books and the development of children's books, so as to clarify the research direction and Angle, clarify the research object and scope. Solid theoretical foundation of this study.

4.2. Questionnaire survey method

In view of the problems existing in various types of interactive children's books in today's market, including traditional children's books, it is necessary to issue paper and online questionnaires to understand and master the views and consumption demands of consumer groups of different family levels on interactive children's books on table screens, and organize and analyze relevant data. So that the table screen interaction and children's books integration and redesign can meet the market demand and consumer aesthetic.

4.3. Case comparison method

During the study, I searched for all kinds of interactive children's books and products on the Internet. I took Shanghai as the benchmark to understand the sales and operation status of interactive children's products. I took pictures of the real products and classified the interactive expression techniques, so as to form the original materials for the comparison of later cases. Using the comparative analysis of cases, the table screen interactive children's books are classified for horizontal and vertical comparative analysis, and collect typical design cases at home and abroad for a comprehensive individual analysis and cross analysis, to find the common features of interactive children's book design, laying the foundation for the later construction of table screen interactive children's book design method. At the same time, the traditional children's books and interactive children's books are compared to analyze the advantages and disadvantages of the two.

4.4. Experiment method

In the analysis of the influencing factors of interactive design of children's books table screen, different problems at the functional level, the action level and the emotional level are put forward through the experimental method. After collecting data, corresponding hypotheses are proposed and tested. Finally, theories and research conclusions are tested and improved to form theory and practice, and so on. For example, relevant assumptions were made in the first round of experiments, such as: the reward mechanism in the game will improve children's emotions, and then corresponding design experiments were designed to test. Through the implementation of the experimental analysis results, and then draw a conclusion. If the conclusion does not agree with the hypothesis, the hypothesis should be remade and then verified.

5. Conclusion

Firstly, this paper describes the research status at home and abroad from the perspectives of interaction design, children's perspective, children's interactive reading material, children's physiological development and children's psychology. Then, the problems of existing technology and methods are analyzed. Secondly, the main significance of the research is described from four aspects: helping to sort out the current situation of interactive children's books, analyzing the influencing factors of interactive design in children's books, improving the interactive way of children's books and optimizing user experience, and providing reference for the style of interactive children's books on the table screen. Finally, four research methods, including reference research, questionnaire survey, case comparison and experiment, are proposed to explore children's interactive design.

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