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Parenting Interactive APP Design Based on Positive Psychology Perspectives—An Example of "Toca Life: World"

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Abstract: This study focuses on the design of interactive APPs for parent-child education from the perspective of positive psychology, and takes the popular APP Toca Life: World as a case study for in-depth analysis. By elaborating the core value of positive psychology in parent-child education, analysing in detail how the APP fits with the principles of positive psychology in terms of functional design and user experience, summarising its successful experience, and providing targeted strategies and suggestions for the design of interactive APPs for parent-child education, the study aims to promote the optimal development of APPs for parent-child education, and to better promote parent-child relationship and the cultivation of children's positive psychological qualities. The aim is to promote the optimal development of parent-child education APPs and better promote parent-child relationship and the cultivation of children's positive psychological quality.

1. Introduction

1.1 Background and significance of the study

In the digital age, mobile applications (APPs) have become an important tool for parenting education. As parents pay more attention to their children's all-round development, the APP market for parent-child education is booming. However, some APPs are designed to focus only on knowledge transfer, neglecting the enhancement of parent-child relationship and the cultivation of children's positive psychological qualities. Positive psychology, as a discipline dedicated to the study of positive strengths and excellent qualities of human beings, provides a new perspective for the design of interactive APPs for parent-child education[1]. Incorporating the concept of positive psychology into the design of APPs can help create apps with more educational value and promote parent-child interaction and children's healthy psychological development. Toca Life: World, as a globally popular interactive parent-child education APP, has attracted a large number of parent-child users with its unique design. The in-depth study of this APP can provide valuable experience for the design of other parenting interactive APPs, enrich the application of positive psychology in the field of parenting digital product design, and promote the development of parenting APPs in a direction that better meets the needs of children's psychological development and parent-child interaction.

1.2 Research methodology

This study mainly adopts the case study method, user experience research method and literature research method. Through a detailed case study of Toca Life: World, we dissected its functional modules, interaction design, content presentation and other aspects to explore how it embodies the concept of positive psychology[2]. Conduct user experience research to collect feedback from parent-child users on the APP and understand their actual experience and needs. At the same time, we review the literature related to positive psychology, parent-child education and APP design to build a solid theoretical foundation and provide comprehensive support for the study.

2. Core values of positive psychology in parenting education

2.1 Motivation of positive emotions

Positive psychology was proposed by Seligman, and its core concepts include positive emotions, positive traits and positive institutions. Positive emotions broaden an individual's scope of thinking and action, and increase psychological resilience; positive personality traits, such as optimism and resilience, help individuals cope with life's challenges; and positive social organisational systems, such as the family and the school, provide support and resources for an individual's development. Barbara Fredrickson published important articles on the Extended-Construct Theory of Positive Emotions in the Review of General Psychology in 1998 and in the American Psychologist in 2001. Fredrickson's Expansion-Construction Theory of Positive Emotions suggests that positive emotions (e.g., pleasure, interest, satisfaction, etc.) are more than simple responses to current situations, but have the function of expanding an individual's thinking and action patterns. When individuals experience positive emotions, their attention span expands, their thinking becomes more flexible, and they are more willing to try new things and explore new areas. In the long run, positive emotions can help individuals accumulate psychological, physiological and social resources and promote personal growth and development. In parent-child art activities, children often experience positive emotions in the process of creating artworks and interacting with their parents, which helps them expand their cognitive boundaries and enhance their problem-solving abilities. In parent-child education, children learn more efficiently and their creativity and imagination are better stimulated when they are in a positive emotional state[3]. For example, a happy mood can broaden a child's mind, making him or her more open to trying new things and exploring new knowledge. Parent-child interactive apps that design interesting and attractive activities and content to stimulate children's positive emotions will help improve the effectiveness of education.

Therefore, the Toca Life: World App is designed to be highly compatible with the concept of positive psychology and has important educational and developmental value. From the perspective of positive emotion stimulation, its colours, sound effects, fun activities and open sandbox mode create a positive emotional experience for children, which, as Frederiksen's theory emphasises, helps to broaden the scope of children's thinking and actions. In the process of experience, children's attention and thinking will be exercised, and they will continue to explore the rich scenarios and gameplay in the APP, which is the embodiment of the function of expanding positive emotions.

2.2 Parent-child interaction and relationship building

A good parent-child relationship is the cornerstone of a child's healthy development. Positive psychology encourages positive interaction between parents and children, and enhances the emotional connection between parents and children through joint participation in activities and

communication. Parent-child education interactive APPs can provide parent-child co-operative games, tasks and other functions, creating more opportunities for parent-child interaction and promoting the harmonious development of parent-child relationship.

2.3 Developing positive qualities and psychological capital

Positive psychology focuses on developing positive qualities in children, such as optimism, resilience, co-operation and creativity. These positive qualities constitute children's psychological capital, which helps them cope with life's challenges and enhance their sense of well-being and adaptability. The Parenting Interactive App can guide children to develop positive qualities and enhance their psychological capital through carefully designed educational content and activities.

3. Overview of the Toca Life: World app

Toca Life: World is developed by Toca Boca, a company specialising in digital product development for children and known for creating creative and fun games. The APP is available on a wide range of mobile devices and is aimed at children aged 3 - 12 and their parents. It is an open-world simulation game that provides a virtual space for children to explore and create, featuring a variety of scenarios with different themes, such as cities, towns, beaches, hospitals, schools, etc. Each of these scenarios highly reproduces real-life situations. Each scene is highly reproduced from real life, with rich details and interactive elements. Children can control the virtual characters to travel freely in the scenes and interact with the objects and characters in the scenes. For example, in the hospital scene, children can play the role of a doctor to see patients and use various medical equipment[4]; in the school scene, they can attend classes and participate in extracurricular activities. Children can create their own virtual characters and personalise them. From hairstyles and outfits to accessories, there are plenty of options for children to be creative. By dressing up their characters, children are able to express their own personalities and aesthetic concepts. Children are encouraged to create their own stories using scenes and characters. Children can freely arrange the characters' actions and dialogue to build a unique plot. This feature gives full play to the child's imagination and creativity, and also helps to improve the child's verbal expression and logical thinking skills. as show in Figure 1.

Figure 1: Toca Life: World Game Interface

4. Analysing the APP design of Toca Life: World based on the perspective of positive psychology

4.1 Positive mood stimulation design

In Emotional Design, Donald A. Norman mentions that emotions play a key role in design, influencing the user's experience and perception of a product. The Toca Life: World app uses colours and sound effects to stimulate positive emotions. It adopts a bright and vibrant colour style, and the buildings, plants and characters' costumes in the scenes have attractive colour combinations, which can instantly catch children's attention and stimulate a sense of pleasure. At the same time, it is paired with relaxing background music and rich and interesting sound effects, such as the laughter of the characters and the operation of objects, to further enhance the positive emotional experience. For example, in the beach scene, the sound of waves and seagulls combined with the relaxing background music allows children to feel pleasure and relaxation in the scene. A variety of fun activities are also key to stimulating positive emotions. Each scene is set up with many interesting interactive links, such as shopping and organising the shelves in the supermarket scene, and experiencing the rides in the playground scene. These activities are not only entertaining, but also challenging, and children can gain a sense of achievement by successfully completing the tasks, reinforcing positive emotions[5].

One of the design highlights of the APP is the open-ended digital sandbox model with no goal restrictions. In the virtual world, children are free to create characters and stories as they wish, without having to follow specific tasks or goals. This gives children great creative freedom and stimulates their imagination. For example, children can combine different scenarios to create a fantasy world that combines city streets and mysterious forests, and set up character backstories and adventure plots. This "no-pressure interaction" model prevents children from becoming frustrated when they fail to achieve their pre-set goals and is consistent with the principles of positive emotion development. The child is always in a state of autonomy and pleasure when creating freely, and continues to experience the fun and satisfaction of creation, which constantly stimulates positive emotions.

4.2 Parent-child interaction for design

The APP supports parents and children to control virtual characters together to complete tasks or create stories in various scenes. For example, in the house building activity, parents and children can divide the work, one person chooses the building materials, one person is responsible for building, through the collaboration to complete the task, increase parent-child communication and interaction, and enhance the relationship. In the story creation and other functions, the app has a parent-child communication guidance mechanism. When the child creates a story, parents will be prompted to discuss with the child the plot of the story, the characteristics of the characters, etc. This encourages parents and children to have in-depth exchanges, share ideas and creativity, and promotes the development of parent-child relationship.

4.3 Positive Quality Development Design

The richness of scenes, characters and objects provides children with a wide range of creative space, which is an effective way to expand the creativity of users in design theory. Children can freely combine scene elements, design unique characters and write personalised stories. For example, combining a hospital scene with a space scene to create a story about rescuing aliens in space, this kind of cross-scene creative combination helps to cultivate children's innovative thinking.

From the perspective of cognitive development theory, providing children with diversified stimuli and resources can promote their brain development and mind expansion. The design of the APP is to stimulate children's creativity through rich content, which is in line with the concept of helping users to improve and develop their abilities.

Under the co-operation mode, parents and children need to cooperate, communicate and co-ordinate with each other, so as to cultivate children's co-operation ability. Meanwhile, the social elements in the app, such as interaction between characters and communication with other online players (supported by some versions), allow children to learn to get along with others, share and co-operate, and improve their social skills. In the school scenario, children control their characters to participate in group activities with their virtual classmates, and through co-operation to complete tasks, they learn to listen to others' opinions and improve their teamwork skills. Design theory emphasises that by simulating real social situations, it can help users improve their social skills. By setting up various social scenarios and interactive sessions, this APP creates opportunities for children to practice their social skills, which is in line with the design direction of promoting the cultivation and development of users' social skills.

4.4 UI design adapted to children's cognitive characteristics

Considering that children's fine motor development is not yet mature, the APP adopts large buttons with large size in UI design, which is convenient for children to click and operate, and reduces the probability of misoperation. In terms of design principles, this reflects the concept of designing based on users' physiological characteristics. Children's hand muscles and nerve control are not yet perfect, so the design of large buttons is in line with their operating characteristics and improves the convenience and smoothness of use. From the perspective of cognitive psychology, when users can easily complete the operation, they will be less irritated and more focused on the contents and activities of the APP, which is conducive to maintaining positive emotions, which is in line with the goal of the design to pursue a good user experience and reduce the obstacles to the operation of the APP.The APP uses high contrast colours, such as bright red and green, yellow and blue, to attract children's attention and highlight the important elements of the interface such as the function buttons and interactive objects. High-contrast colours, such as red, yellow and blue, can attract children's attention and highlight important elements of the interface, such as function buttons and interactive objects. Children are more sensitive to high-contrast colours during their visual cognitive development stage, and this kind of colour design enables them to quickly identify key information, understand the operation logic of the APP, enhance their sense of control, and improve their positive emotional experience. For example, in the blue ocean background scene, the golden treasure chest is particularly eye-catching, attracting children to explore and operate. This design is in line with the theory of visual perception in Gestalt psychology, highlighting key elements through colour contrasts, helping users to quickly understand and process information, and optimising the user's visual experience and cognitive process from the design level[6].

5. Summary of Successful Lessons Learned from the App Design of Toca Life: World

5.1 User needs orientated design concepts

In the field of design, the concept of User - Centered Design (UCD) emphasises a deep understanding of users' needs, expectations, behavioural patterns and emotions as the core basis for product design. The Toca Life: World app accurately practices this philosophy. Through extensive user research, including child psychology research, parent-child interaction behaviour observation and feedback collection from target user groups, the app provides in-depth insights into children's

psychological development and parent-child interaction needs. From the perspective of children's psychological development, Piaget's theory of cognitive development points out that children have unique cognitive characteristics and desire for exploration at different stages. In terms of scene setting, the APP builds rich and varied scenes such as supermarkets, playgrounds, hospitals and other scenes that are close to children's life experience, which meets children's needs for exploring the world around them, and provides them with a space for simulating reality and free exploration. In terms of character creation, children are given the right to choose and design on their own, which is in line with their desire for personalised expression at the stage of self-awareness development. The story creation function provides a platform for children to give full play to their imagination and creativity, which meets the needs of children's logical and abstract thinking that develops gradually in the stage of concrete arithmetic and formal arithmetic. This approach, which starts from the user's needs and is closely centred on the user in all aspects of functional design and content presentation, provides the user with a product experience that is highly tailored to the user's needs and is the cornerstone of its success.

5.2 Design Strategies for the Integration of Education and Entertainment

Edutainment (edutainment) design strategy has attracted a lot of attention in educational product design in recent years. It aims to integrate educational content into entertaining activities and experiences to increase user interest and engagement. The Toca Life: World app is a successful example of this strategy. According to Gardner's theory of Multiple Intelligences, individuals have multiple types of intelligence, including linguistic, logical-mathematical and interpersonal intelligence. The app develops these abilities through a variety of games. In the story creation section, children need to organise language, conceive plots, arrange character relationships, etc. This process greatly exercises their language expression and logical thinking skills, which corresponds to the cultivation of linguistic and logical-mathematical intelligences. In cooperative activities, for example, in the school scene, children control the characters and participate in group activities with their virtual classmates or parents. In the process of interactive communication and division of labour to complete the tasks, children learn to listen to others' opinions, reconcile different points of view, and solve the problems together, which effectively enhances their cooperation and social skills, which is exactly the embodiment of the cultivation of interpersonal intelligence. This kind of design, which integrates educational elements into entertaining game play without any trace, avoids the dullness and tediousness of pure knowledge instillation compared with traditional education. Through the experience of gamification, children are inspired to actively participate in learning, so that while enjoying the fun of the game, they can achieve the cultivation of positive qualities and cognitive ability enhancement in a subtle way, reaching an organic integration of education and entertainment, and providing an excellent example for the design of educational products.

5.3 Continuously updated and optimised operating model

In product operation, continuous innovation and iterative optimisation are key strategies to maintain product competitiveness and user stickiness. The development team of "Toca Life: World" APP understands this well, and by continuously updating the APP with new scenarios, characters and activities, they have applied the concept of "Continuous Evolution Design" in the field of design. As time passes and user needs change dynamically, products that remain static are easily eliminated from the market. The APP constantly launches new scenes, such as the mysterious magic castle scene and the future city scene full of sense of science and technology, bringing users a brand-new exploration experience; the addition of new roles, such as superhero roles with special

skills and fantasy roles from the fairy tale world, has enriched the ecology of the game's roles; and the design of novel activities, such as time-limited themed parties and creative challenges, has stimulated the users' enthusiasm and desire for exploration, and always maintained their participation in the game. The design of novel activities, such as limited-time theme party activities and creative challenge activities, stimulates users' enthusiasm and desire for exploration, and keeps the APP fresh and attractive. At the same time, we optimise the functions according to user feedback, which follows the principle of user feedback-driven design improvement in User Experience Design (UXD). By collecting users' feedback and suggestions, the development team can pinpoint the deficiencies of the product, such as optimising the smoothness of the operating interface and adjusting the convenience of certain functions. This operation mode of continuous updating and optimisation enables the APP to continuously adapt to and meet the growing needs of users, maintain high user stickiness, stand out in the fierce market competition, and achieve long-term stable development of the product. As show in Figure 2.

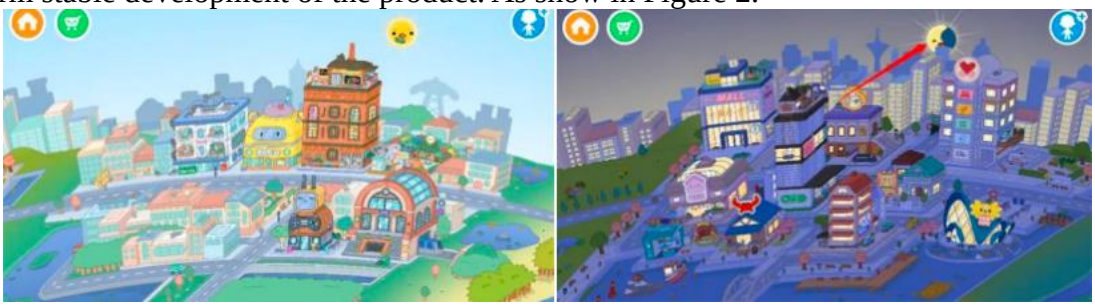

Figure 2: Scenario map of the Toca Life: World game iteration

6. Conclusions and outlook

In this study, the design of interactive APPs for parent-child education is explored from the perspective of positive psychology and analysed in detail using Toca Life: World as a case study. Positive psychology has an important value in the design of interactive APPs for parent-child education, which can enhance the educational effect and user experience of APPs by stimulating positive emotions, promoting parent-child interaction, and cultivating positive qualities. Toca Life: World successfully embodies the concept of positive psychology in its design, which provides valuable experience for other interactive parenting APPs. Based on this, strategies such as positive emotion-oriented interface and content design, parent-child interaction enhancement design, and positive quality cultivation design are proposed, and corresponding strategies are proposed to deal with the challenges faced during the design process.

In the future, parent-child education interactive APP will develop in the direction of more intelligent, personalised and diversified. With the application of artificial intelligence, big data and other technologies, the APP will be able to provide personalised educational content and activities according to each child's learning situation and interests. Interdisciplinary integration will be further deepened by integrating art, science, humanities and other elements into the design of APP to expand the connotation and extension of education. At the same time, more attention will be paid to the cultivation of parent-child relationships and the creation of a family atmosphere, providing more opportunities for parents and children to grow together and interact with each other. Future research can further focus on the impact of APP design on children of different ages and cultures, and how to make better use of emerging technologies to improve the quality and effectiveness of interactive APPs for parent-child education.

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