

# Research on the Application of UI Icon Design in Children's Vision

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**Abstract.** With the rapid development of Internet technology, more and more children's digital books have entered people's lives. Based on children's perspective, the design style of UI icons is analyzed through literature research, and the design of children's UI icons is summarized. Through investigation and analysis, in terms of the UI icons of children's digital books, it is necessary to balance functionality and aesthetics. It is not only necessary to correctly transmit information, but also have corresponding personalization and principles to make children's digital books more educational and guiding functions.

**Keywords:** Children's Vision; UI Icon Design; Application Research.

## 1. Overview of UI Icon Design

### 1.1 The Concept of UI Icon Design

Regarding UI logo product design, we should first understand the concept of UI product design, and UI is a simple general term for User Interface (user interface), which is divided into two levels: visual effect product design and interactive product design. In the visual effect product design level, it involves not only the visual effect product design of the overall design of page layout and color matching, but also the detailed aesthetic product design of buttons, logos and text. The human-computer interaction level includes the overall feeling product design such as action logic mode product design and human-computer interaction experience design. In addition, there are specific image visual effect product designs such as different state switching of keys and cut scenes animation design. However, the logo design of UI is mainly a graphic design with reference marking characteristics. It is not only an image, but also a logo. It also has the characteristics of highly condensed and rapid transmission of information, more retention than traditional text linking methods, and convenient memory.

### 1.2 Classification of UI Icon Design

In interface visual design, icon design will be a very critical part, and the expression of icon design will also develop towards the goal of more diversified, refining and easy-to-know. There are three main items in the division of UI icon design, followed by icon attribute classification, icon form classification, and icon expression classification. Each of them has different creative concepts and characteristics. Among them, startup icons and functional icons are included in the division of icon attributes. The typical representative of startup icons is the application in the mobile APP, while for functional icons, it is the dispensable parts of the APP interface, such as return, deletion, downloading and other icons that can represent current information and actions. In the classification of expressions, it is divided into 3D, 2.5D and 2D visual effects. Among the basic types of icons, it mainly includes pixel icons, mimicry icons, flat icons and hand-drawn icons. Flat icons basically mean that superfluous details and decorations will not be added to the design. The concise and easy-to-understand language conveys the design meaning of icons. The main characteristics are freshness and strong sense of art. For mimicry icons, things that are closer to reality are selected to express. The imitation of the real world is often exquisite and delicate and highly recognizable. People can quickly experience its role at a glance, and it is quite complicated in the design stage of detail creation.

## 2. Principles of UI Icon Design from a Children's Perspective

### 2.1 Features of UI Icon Design in Children's Vision

Among children's books, children are the main user subject. Therefore, in the design of UI icons, children's understanding ability, aesthetic preferences and educational knowledge should be dominated by children, more attention should be paid to convenience in the setting of operation, and the comfort is in line with the high-quality orientation design of children's reading and learning. In the design of children's comfortable reading materials, we should pay attention to the following points:

The UI icon operates smoothly. The setting of UI icons will guide children's understanding operations, thus considering the incomplete development of children's hand operations and avoiding the complexity of multiple interface windows. Therefore, designers should vigorously conform to children's behavior habits in designing icons of children's books. Icon buttons should be appropriately eye-catching to facilitate children's click and touch.

UI icon color matching. Children's aesthetics are different from adults. For early childhood education, color greatly stimulates children's awareness and interest. Most children who use children's books are over 3 years old. The development of color cognition to the fourth stage is a space period of visual development. They fully feel the colorful and colorful colors of nature. Appearance and color have also become their first impression of one thing. It is also one aspect of the focus on in UI icon design. Pay attention to color matching, bright colors and the adjustment of cold and warm colors, enrich the conciseness and brightness of icons, and attract children's attention.

### 2.2 The Direction of UI Icon Design from a Child's Perspective

Compared with traditional paper books, the whole of digital books is divided into two major directions, namely, education and entertainment. The two types of directions are different in icon design. In terms of formal connotation, education and entertainment have a certain commonality. "Education through fun" learns on the basis of interest.

Therefore, the display of icons plays a more prominent role. It should not be too entertaining and take clarity as the foundation. At the same time, in the icon, due to different connotations, the styles expressed are different. In art education, the color used in the logo is the language of many people who took the lead in plastic arts. Compared with the shape of the logo, the color is more eye-catching, and the visual impact is more intuitive, deeper and far-reaching. Color affects people's hearts by influencing people's vision, thus producing aesthetic ability. The color beauty of icons is a key shortcut to increasing software value. This chapter will explain the use of colors from the following three perspectives.

(1) The eyes are rich and bright in color, but in appropriate size to avoid visual fatigue and protect vision. Children prefer bright and rich colors, but the colors in the icons, such as too bright and too strong contrast, can easily cause visual fatigue and even damage the eyes. At the same time, the color is too rich and it is easy for lower-grade children to pay too much attention to the richness and local pictures of the color, resulting in the neglect of important information.

(2) Scientific and appropriate color use. In the environment used, the consistency between colors and other visual elements must be taken into account. Therefore, in the use of the color of the game logo, we should not only choose bright and rich colors, but also pay attention to the cooperation of colors and the overall harmony and coordination of language (including the cooperation of graphic colors, the color matching of icons and text, the coordination of icons and text and the overall color, etc.).

Otherwise, children will be unhappy. Pay attention to the overall cooperation of the logo, stimulate the purpose of making children's desire to click, and make the whole interface more harmonious.

(3) Use the visual and psychological functions of color to set off the environment. Different emotional feelings such as cold and warmth, lively and quiet produced by colors, coupled with the unique personality characteristics of different colors, can be felt and recognized by preschool children. Therefore, the reasonable use of colors in icon settings can increase the atmosphere, or render a

cheerful atmosphere to make children more willing to touch the application, or integrate the game to mobilize the whole environment to induce emotional activities, improve the cognition of the game, enhance the feeling and memory, etc.

### **3. Requirements for UI Icon Design in Children's Vision**

With the development of mobile intelligent terminal products, the research and development of application programs has been launched quickly. The APPs in the IOS system and Android system are constantly being updated. At the same time, the children's special The group has also become the main focus of application developers, and these apps have also brought children a brand-new mode of play and cognition. Because the homogenization tendency of children's APP in products is very obvious, and it cannot form a significant difference with similar products, the center of gravity of the product has gradually shifted to the emotional needs of children.

As the image symbol of the APP, the icon is also the first object of emotional evaluation of users. In many children's apps with the same functions, the standard for evaluating users' emotions is often just a short text description. The most important thing is to speculate whether the APP meets its basic needs and aesthetic tendencies through the emotional feelings of icons, so as to judge whether the APP can be used. Therefore, in response to the trend of industrial intensiveization and perceptual consumption, innovative companies often try to form a brand characteristic core through emotional product design to win the majority of the consumer market. According to the principle of emotional product design, we first describe children's emotional needs from three different levels of three-level theory, and then extract three sets of emotional vocabulary to comprehensively describe the emotional needs of children's products. Then use emotional engineering technology to obtain emotional elements and convert them into specific product design parameters, complete and emotional product design method model from user emotions to products, hoping to provide reference and use value for more emotional product design processes between children and products.

#### **3.1 Analysis of Children's Needs based on the Instinctive Layer**

Product design at the ability level pays more attention to the preliminary understanding of people's sensory organs. In the product design of icon instinct, visual effects play a decisive role. Children's emotional feelings about visual effects are mainly manifested in three levels: specific shape, tone and feeling. In the early childhood, the specific shape is easier to understand and accept than the abstract form. The emotional characteristics of the shape are mainly reflected in the vivid shape of the characters, soft curves, rich and diverse colors, simple content and soft feeling. Because color can affect people's emotions, children in the stage of visual growth are more sensitive to bright colors. Rich colors and bright appearance can attract children's attention, but the proportion should be appropriate to avoid children's visual fatigue. The emotional needs of specific images for colors are mainly reflected in warm colors, brightness, softness, diverse colors, liveliness, etc. The texture of the icon is displayed by the visual touch experience. In the selection of texture, it is necessary to take into account the child's cognitive stage, and select the texture and light and shadow materials that the child's cognitive love and can successfully cause the touch experience. The child's emotional requirements for quality are generally soft, meticulous, real, soft and smooth emotional phrases.

#### **3.2 Behavior-based Child Needs Analysis**

At the functional level, the effectiveness of icons is emphasized, and the specific sensibility reflects the effectiveness of interaction, semantic commonality and visual visibility. The effectiveness of interaction means that the icon is highly condensed and can quickly convey information and efficiently reduce the memory burden. Users can clearly capture important information such as the theme and characteristics of the APP at a glance. Image identifiers are more common than Chinese characters, especially for young children. Because image icons similar to physical objects are most suitable for cognitive experience, they are easier to identify and have Semantic

universality. Regarding the visibility of human vision, it is first required that the image icon is different from the real environment for users. Its shape, color, form and other information content are easy to identify, and the semantic expression of the unique, ambiguous and behavioral phrases.

### 3.3 Analysis of Children's Needs Based on the Reflection Layer

The settings of icons should not only be easy to use, but also allow users to have emotional resonance. The beauty you can feel is not absolutely usable. Only through reflection can a real and beautiful feeling be produced. Its root causes are mainly the emergence of meaningful emotional interaction activities with the realization of the user's own value, the realization of their own expectations, or the awakening of memories of experiences. At the level of thinking, it is also easy to be limited by individual differences such as education, experience and social status. Children also belong to a special group. There are many differences between them and adults at the level of action, emotion and concept, which is also the focus that designers need to pay attention to. From the perspective of individual development, people's image is mainly composed of some personalities, hobbies, habits, interpersonal relationships, and forms of social activities. The most important thing here is to establish a good image of users and carefully understand and discover the needs of users. It reflects the need to realize individual values at the level of Maslow's needs, while children's expectations and realization are mainly determined by children's initiative, competence and satisfaction in behavioral activities and the satisfaction of the interpersonal environment. When the icon is set, it touches the child's subjective feelings as much as possible, so as to show that the APP can give children new life skills and emotional pleasure. For children, he is willing to learn new skills, but hopes to get competent satisfaction from them and the relationship environment more meaningful for his own satisfaction. It is easier for children to be satisfied when they are in a safe and happy relationship environment. From the perspective of memory experience, the creativity of children's APP icons should be able to stimulate children's memories of the past, happiness and jumping. Therefore, the extraction of icons must choose elements closely related to users, and this kind of content has special value to consumers. For children, past game experiences, such as summer camps, birthday parties, or children's passionate cartoon styling, can stimulate their memories.

## 4. Conclusion

Children's digital icon vision is not a simple accumulation of various bright colors. Moderate color transformation and stimulation are also conducive to children's mental health and normal cognitive awareness, and scientific color design methods can also improve the use effect of products. In the paper, it is pointed out that the feasibility of using icon and color contrast to enhance visual efficacy methods is confirmed through theoretical analysis, and the correct color design principles are pointed out. It makes up for the current shortcomings in the design and visual ergonomic research of the children's interactive user interface. The focus of future work will start with the actual design of children's APP interactive user interface, and set special interactive tasks to influence the hue difference on children's interactive experience.

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