

# Research on Multi-sensory Experience Design of Children's Picture Books

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**Abstract:** *Objective: This paper aims to explore the new development direction of children's picture books by focusing on the multi-sensory experience design of children's picture books. Methods: The analysis was conducted from five dimensions: visual experience design, auditory experience design, tactile experience design, smell experience design, and taste experience design of children's picture book design. Conclusions: 1) Multi-sensory experience design will be further deepened and expanded in the future research of children's picture books. 2) Multi-sensory experience design will guide the development of contemporary children's picture books in a new direction.*

**Keywords:** Children's picture book; Design; Multi-sensory experience.

## 1. INTRODUCTION

As a carrier of children's enlightenment education, children's picture books have unique artistic value and educational significance. They are an important window for cultivating children's artistic sentiment, building multiple intelligences, and understanding the world. With the continuous advancement of early childhood education, the story content, presentation form, material use and morphological design of children's picture books are all innovating and progressing. The design of children's picture books with multi-sensory interactive experience has also received unprecedented attention. This type of picture books focuses on sensory experience and memory effects, strengthens the cognitive function of picture books, makes creative thinking more flexible, and creative technology is more advanced, allowing children to gain from reading. Healthier physical and mental development and richer life knowledge, such as distinguishing good from bad, contacting hot and cold, identifying size, experiencing soft and hard, sensing sweet and sour, etc., by stimulating children's imagination and association, improve their ability to think and express actively. It provides more favorable conditions and broad space for children to establish a correct cultural outlook, artistic outlook and values.

## 2. THE VALUE OF MULTI-SENSORY EXPERIENCE IN CHILDREN'S PICTURE BOOKS

### 2.1 Conducive to Stimulating Children's Interest in Reading

In the context of the new media era, the combination of diversified interactive forms and paper media can make picture books have new breakthroughs in reading modes, cognitive methods, communication methods, etc. Multi-sensory interactive experience design can easily stimulate children's interest of reading picture books, allows children to change from readers and experiencers to creators, and effectively participate in the plot of picture book stories. For example, the picture book "Come, Smell the Smell of Nature", which is very popular among children, uses personalized materials and exquisite production techniques to give the picture book a unique style. The moment the cover is opened, readers feel as if they are in a gorgeous garden: colorful samples of flowers and spices, realistic fruit and vegetable patterns, and exquisite decorative materials. As long as children gently touch the graphics in the picture book, they can feel the corresponding graphics. The taste of nature: sour lemon, fragrant mango, milky strawberry, etc. are refreshing. Multi-sensory comprehensive stimulation not only exercises children's limb flexibility, but also achieves children's multi-sensory integration. It builds memory of nature through olfactory cognition, allowing children to rise from the behavioral level to the reflective level, and improve their understanding of nature.

### 2.2 Helps Improve Children's Understanding

Children's picture books integrate multiple sensory experiences, which are conducive to the construction of children's sense of space and the activation of creative neurons, and are conducive to the improvement of children's

ability to accept and understand picture book information. Interactive children's picture books emphasize the coexistence of knowledge and fun. Take a look, touch, and smell [1]. It requires children to use their hands as well as their brains. The simultaneous use of multiple senses enhances children's curiosity and freshness, providing multiple reading experiences. It can also quickly stimulate children's desire to explore and seek knowledge, and help improve children's understanding. For example, the children's picture book "Listen, What Sound" combines sounds with scenes. The sound sources in the picture book are all original sounds from nature, such as melodious piano music, the sound of rain, croaking frogs, etc. Children deepen their understanding of nature by listening and watching, and then gradually establish relevant and orderly images of things, completing the transition from sensory experience to emotional connection, and realizing the perfect connection between experience and life.

### **2.3 Conducive to Satisfying Children's Psychological Characteristics of Exploring and Seeking Knowledge**

Multi-sensory experiential children's picture books cleverly combine the structural design of the book with the story content of the book, allowing children to integrate the plot and scene shaping through actions such as pulling, touching, turning, and pressing while reading the picture book. It not only satisfies children's desire for knowledge to explore the world, but also exercises children's comprehensive coordination ability. For example, the best-selling picture book - "Revealing the World by Reading Books: Revealing the Car" is deeply loved by parents and children. The main reason why this book adopts a hidden three-dimensional design is that the rich and colorful car knowledge in the book is easy to understand and exquisitely designed. The 3D interactive bouncing mechanism is fun to operate. Before children open the picture book, they see colorful pictures of car exteriors; after clicking on the mechanism, children are greeted by various three-dimensional car structure models, such as car internal structure models, car engine structure models, car manufacturing processes, etc. Super-simulated situational design leads children from the city to the countryside, from the construction site to the playing field. Three-dimensional reading arouses children's sensory functions in an all-round way. Through seeing with the eyes, touching with the hands, turning with the arms, and thinking with the brain, it realizes the transformation from vision to touch, then from touch to imagination, association and divergence thinking, children can explore the ocean of knowledge under the guidance of curiosity.

### **2.4 Helps Satisfy Children's Instinct to Play Games**

The integration of fun in picture books can stimulate children's interest in reading and enhance children's active participation. Picture books with interesting interactions as the main form of expression can not only satisfy children's playful nature, but also trigger children's motivation to actively read, allowing children to enter the storyline faster and satisfy their psychology of continuous exploration. Through game interaction in picture books, children's body control and movement flexibility can be enhanced; it can promote the development of children's perceptual functions, achieve mutual coordination of various senses, and stimulate the development of neurological functions; it can improve children's language expression ability and communication skills; through imitation and imagination in games can improve children's ability to understand and solve problems, and promote the development of children's cognitive abilities. For example, "Playing Picture Books from Head to Toe" is a book about how to transform from picture book reading to picture book games. The book selects 23 picture books, 127 types of puzzle, language, character, and construction game activities, and 68 small game videos. Each picture book can lead to multiple interesting games, such as music games, sports games, etc. Through the design of game links, children's active and effective mental state is mobilized, and children's sufficient curiosity, keen observation, and their strong imitation ability and high enthusiasm for entertainment allow them to actively participate in game reading, enhance their self-confidence in the game, and achieve the integration of sensory experience, emotional experience and behavioral experience in the game, allowing children to love reading from the bottom of their hearts.

## **3. ANALYSIS OF THE OVERALL DESIGN OF CONTEMPORARY CHILDREN'S PICTURE BOOKS**

The advancement of science and technology has broadened the media for children's education. Children's picture books also have more diverse expression forms. The use of materials is more scientific, the design methods are more advanced, and the production techniques are more novel. The concept of converting from two-dimensional space to three-dimensional space has also been improved. Under the call of the times, children's picture books have changed the traditional appearance of single design form and embarked on an innovative path that is more conducive to children's growth. The famous psychologist Piaget believed that each cognitive stage of children has different characteristics: children's early reading process is a linkage process in which vision and hearing

complement each other. As children grow, this reading process gradually becomes a multi-sensory process. Through comprehensive experiences, they gradually build cognition and emotional resonance in their minds with the sounds they hear, the images they see, the materials they touch, and the smells they smell, achieving cognitive development and growth. Therefore, children's picture books are an interactive book form that integrates sensory experience, behavioral experience and emotional experience. Excellent picture books should develop children's interests and potential in many aspects and angles. They must have exquisite and vivid images, rich and beautiful sounds. Sound effects, precise touch settings and highly realistic three-dimensional simulation shapes. The coexistence of multiple information media brings children a multi-sensory interactive experience, stimulates children's imagination, and enhances children's problem-solving abilities and self-reading abilities.

#### **4. MULTI-SENSORY EXPERIENCE DESIGN STRATEGIES FOR CHILDREN'S PICTURE BOOKS**

The processes of feeling and cognition are collectively called perception. Perception is the process by which people process information obtained by the brain. Babies have a perceptual system from an early age. As the sensory organs of the body develop, the perceptual system continues to improve. As a medium for children to experience and understand the world in childhood, picture books are an indispensable and important carrier in the development of the perceptual system. If the designer effectively integrating multi-sensory information such as vision, hearing, touch, smell, and taste in picture books not only respects children's physical growth and development, but also protects children's life growth.

##### **4.1 Visual Experience Design of Children's Picture Books**

Bright color language and rich graphic information are indispensable visual elements in children's picture books. Research on color psychology shows that color is one of the important factors affecting children's visual experience. Color plays an important role in rendering emotions and atmosphere in picture books, and bright and lively warm colors are more easily accepted by children than low and dull cold colors. Effective use of color is an important way to achieve children's visual interaction. First of all, the use of color must be compatible with children's physical and mental development. Children aged five and above have richer cognitions and associations with colors, and a deeper sense of color matching. They are more emotionally active and accept high-purity, high-brightness red, blue, green, yellow and other commonly used colors, so precise and appropriate use of color will make it easier for children at this stage to accept positive information during reading. Secondly, the use of color must be coordinated with graphics and text. The hue, purity, and brightness of the color are the key factors that determine the expressiveness and effect of the color. Reasonable use of color is conducive to creating a comfortable space atmosphere and is conducive to the correct expression of the story content. It is conducive to the complete transmission of the theme ideas of the picture book.

Graphics are the main way of presenting story content in children's picture books and are the primary tool for children to understand the plot, enhance their interest in reading, and improve their self-awareness. Children have rich imaginations, and their cognition and thinking are often self-centered and ignore other things around them. Therefore, concise, clear, anthropomorphic and cute illustrations drawn with pure and simple lines can better stimulate children's visual experience and play the role of graphics in guiding children's visual organs. At the same time, the graphic elements during the reading process can be set into a coherent and orderly visual guide line to attract children to deeply interpret the content of the picture book, and closely combine vivid and novel visual images, superb painting techniques, and fashionable technological materials with children's aesthetic taste. It allows children to establish connections between other senses based on vision, and enhance their awareness of beauty in a relaxed and enjoyable reading atmosphere.

##### **4.2 Auditory Experience Design of Children's Picture Books**

Hearing is a person's sensory response to external sounds, including the perception, understanding and memory of sounds. The formation of auditory information during children's reading is a continuous and complex process, which is a process of image thinking combined with visual information. In order to allow children to extend their visual experience to distinguish different things and better understand the world, it is necessary to strengthen the important role of auditory experience in the design of children's picture books and promote the three-dimensional sense and diversity of visual experience. For example, the main feature of audio picture books is to take advantage of children's sensitive ear education stage, use CDs, audio and other sound media to make the story content based on the sense of sound, effectively combine music and scenes, from the use and design of picture book materials,

the selection and setting of background music and other aspects to cultivate children's sound enlightenment, use beautiful sounds of nature, small animals, children and musical instruments to stimulate children's understanding of the content of picture books, and strengthen children's understanding of sounds through visual, tactile, olfactory or related stimulation from the external environment. The recognition guides children to establish orderly and relevant concrete images in their minds through sounds, allowing children to use their hearing to experience the world, understand the world through sounds, and gradually gain spiritual growth from audio reading.

#### **4.3 Tactile Experience Design of Children's Picture Books**

Touch is an important organ for people to perceive the external environment. It is also an important way for children to obtain information for cognitive learning when their visual and auditory development is not yet complete. Children's body movements gradually become more coordinated and stable as they grow older, and their tactile recognition abilities will gradually increase. They will continue to contact nature and perceive the world through various touch experiences. The material texture, appearance design, and interior craftsmanship of children's picture books are all important carriers of children's tactile experience when reading. Therefore, in the interactive design of picture books, the selection of materials should be made of comfortable and environmentally friendly materials, such as soft cloth, leather or other safe materials with texture effects. You can also add some high-quality simulated materials or simple touches module. When children touch simulation materials or buttons, the color, shape and sound effects of the picture book will change, effectively stimulating the development of children's tactile nerves, stimulating children's curiosity and desire to explore, and increasing children's reading pleasure; The shape can be safely cut with rounded corners or materialized design related to the content of the picture book, such as designing the shape into a big tree, cloud, puppy, etc. to enhance the echo between the shape of the picture book and the story scene, or hollowing out the picture book cover. Exquisite processing allows children to play hide-and-seek on paper, enhancing children's sensory experience; the interior changes the traditional single plane shape, and makes the plastic images in the story content three-dimensional through layered superposition, using three-dimensional simulation modeling to create a realistic environment. The display trains children to transform from vision in two-dimensional space to touch in three-dimensional space, so that the reading method of children's picture books changes from one-way acceptance to two-way interaction, allowing children to experience immersive reading pleasure in an immersive game experience [2].

#### **4.4 Smell Experience Design of Children's Picture Books**

Human cognition of the world is a combination of various sensory perceptions, and smell is an important part of the perception system. Research shows that the sense of smell is an ability to perceive odors that every healthy person is born with. Children's sense of smell reaches its peak around the age of 5. Children during this period have very sensitive odor discrimination abilities and are very sensitive to odors. The sensitivity is also the strongest. In the multi-sensory design of children's picture books, based on children's olfactory development characteristics and from the perspective of sustainable development and health and safety, interactive devices that increase odor and aromatic plant configurations are used to purposefully guide children to improve their sense of smell. cognitive ability. For example, use environmentally friendly paper and wood with different smells or add safety materials with various smells to the paper. Children can make the smell waft away from the picture books by flipping through the pages or touching them with their fingers, allowing children to see and smell things. To detect the smell of things and use children's olfactory perception ability to make their understanding of external things more clear, three-dimensional and diverse.

#### **4.5 Taste Experience Design of Children's Picture Books**

Taste is a feeling formed after the taste center of the human body is stimulated, and it is related to people's psychological feelings. In the complete experience of taste, other sensory systems such as smell, touch, hearing and vision also play an important role. In psychology, the phenomenon of interaction between various senses is called "synesthesia" phenomenon. For example, we see A green orange will secrete acidic water in your mouth. This is the visual experience triggering the taste experience. In the design of children's picture books, we can consciously guide children to use synaesthesia to transform visual illustrations, vivid colors, realistic sounds and other perceptual experiences into taste associations, so as to cultivate and stimulate children's ability to understand when seeing graphics and hearing sounds. It can be associated with related taste sensations, such as yellow bananas meaning sweetness, yellow-green apples meaning sourness, fried dough sticks sizzling in the pan meaning fragrance, etc., making use of children's existing cognitive experience. Identify various flavors and make the impact of various elements in picture books on children more diverse and three-dimensional.

## 5. CONCLUSION

Picture books are the enlightenment of children's education and the bridge for children to receive knowledge [3]. Multi-sensory experience design has guided the development of contemporary children's picture books in a new direction. In the future, the concept and practice of multi-sensory experience design will be further deepened and expanded in the study of children's picture books, providing more abundant and high-quality educational resources and art resources for children's growth. The multi-sensory experience design broadens the application scenarios and functions of children's picture books, thereby promoting children's potential development and emotional cultivation, improving children's concentration and reading interest, enriching children's cognitive experience and reading experience, and allowing children to thrive in multi-sensory experiences.

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