



Research on Illustrations and Layout Design of Primary School Textbooks Based on Children Reading Psychological Characteristics

Lingling Qiu^{1,a}, Dahlan Bin Abdul Ghani^{2,b*}

¹City University Malaysia (City U), Nanchang Institute of Technology, China

²University Kuala Lumpur, Malaysian Institute of Information Technology, Malaysia

^a8138472@qq.com, ^{b*}dahlan@unikl.edu.my

Abstract. Textbook is an important carrier of students' learning activities. Illustrations and layout design play an important auxiliary role in the achievement of teaching effect, which can help students to better learn curriculum knowledge, enhance their concentration, guide them to feel and appreciate beauty, and better understand the learning content. Based on children reading psychological characteristics, this paper comprehensively studies the role of illustration design and layout design in improving children's (6 to 12 years old) cognitive ability, attention, memory and thinking ability, and on this basis, explores existing problems, and discusses the specific optimization methods combined with the use of visual elements.

Keywords: Primary school textbooks; children reading psychological characteristics; illustration design; layout design;

1 Introduction

The textbooks for children's education are constantly being updated. It is not enough for a good textbook to have good teaching content, and it should have good visual expression. Textbooks are the carrier of learning, which has both educational and aesthetic functions. In primary school, children aged 6 to 12 are in the period of forming aesthetic values. Good aesthetic values can help children develop their aesthetic perception, stimulate their imagination, and help them understand new knowledge. ^[1]

This thesis is a PHD in scientific research.

2 The Current Situation of Illustrations and Layout Design of Textbooks in China, Taiwan, Japan, and Malaysia

2.1 China

Primary schools in China basically uses textbooks compiled by People's Education Publishing House, and the textbooks of all subjects have characteristics of humanity.^[2] The illustrations and layout design of textbooks are often simple and clear, providing concise information. Illustrations are usually used to supplement the text rather than provide visual focus. Layout design is often structured, with clear titles and subheadings to help students understand the learned content.

2.2 Taiwan

To a certain extent, textbooks used in primary schools in Taiwan are more considerate of students' feelings. Illustrations and layout design are often more attractive and colorful, in order to make learning interesting and enjoyable. For example, Taiwan's Mandarin textbooks have exquisite illustrations, with bright colors. Illustrations are used to convey information, and various colors and design elements are used to attract students' attention. The ratio of illustrations and characters in lower grades is basically more than 1:1. Layout design tends to be smoother and more organic, and illustrations and texts are integrated.

2.3 Japan

In Japan, different expression methods are used in textbooks to design the learning content of each subject.^[3] In addition, textbooks attach importance to the feelings of children. The illustrations of textbooks are often exquisite and eye-catching. In addition, illustrations are often complicated and highly stylized, and may have traditional Japanese design elements, such as calligraphy and woodcut. Layout design is often structured and organized, with clear information levels, which helps students understand the learning content.

2.4 Malaysia

In Malaysia, the illustrations textbooks are often colorful, with the focus on creating fun for students and enhancing students' experiential learning.^[4] For example, mathematics textbooks focus on challenging learning themes, and illustrations are used to supplement the text, create a sense of situational experience, and use plots to help children remember. The cultivation of children's comprehensive quality is valued. In addition, comic strips are used in textbooks to improve children's ability of expression and imagination.

Generally speaking, illustrations and layout design in these countries reflect cultural and educational values, and pay attention to clarity, participation, tradition or interest.

Although there are differences in design methods and styles, the ultimate goal is to create a textbook that is attractive, informative and accessible to all students.

3 Children (aged 6 to 12) Reading Psychological Characteristics

Primary school students aged 6 to 12 have certain cognitive and exploratory abilities, and prefer to read illustrations. ^[5]Children aged 6 to 12 can be divided into two categories: the lower grade and the upper grade. The reading psychology of children in the lower grade is mainly based on preschool children. Although children in the lower grade are more mature than preschool children, they still retain some psychological characteristics of preschool children. Upper grade children's reading psychology has gradually divorced from preschool children's psychological characteristics and developed their own unique aesthetic needs, which will affect their emotional and cognitive development.

3.1 Characteristics of Perceptual Ability

In primary school, children are not independent, and their perception of words and pictures is random and emotional. They often only feel some shapes of things, but easily ignore the details. For example, when learning Chinese characters, children often pay more attention to the shape of characters. In addition, it often happens that they unconsciously ignore a certain stroke or confuse characters with similar shapes.

Generally speaking, their perceptual ability have several characteristics: the ability to distinguish basic attributes such as color, shape and size is gradually mature; Be able to observe and describe things accurately, and learn to express the observed characteristics in language; Have a strong interest in daily necessities, have a strong curiosity and are willing to explore the world; Be able to perceive the connection and change between objects and understand some natural laws, such as sound, light and electricity. Be sensitive to visual and auditory stimuli, for example, be able to judge changes in color, pitch, volume and speed; With the enhancement of perceptual and thinking ability, their understanding of the world gradually changes from simple sensory experience to conceptual understanding; Have a high degree of acceptance of new things, and can creatively use the skills and knowledge they have learned to solve problems.

3.2 Characteristics of Attention

According to the research, in general, children in primary school have the ability to concentrate continuously, and the attention is about 20 minutes. However, if the learning content is interesting and rich enough, the attention of children will become longer, even up to 50 minutes. But it also depends on the nature of the task and the level of interest. For primary school children, the complexity and importance of tasks will affect their attention span. For example, if the task is difficult or not interesting, they may soon lose interest and thus lose their attention. On the contrary, if the task is interesting or challenging, they may be able to stay focused for a longer time. Therefore, textbooks

should provide interesting and meaningful learning content, and allow them to exercise excessively, which will help enhance their attention.

3.3 Characteristics of Memory

Children aged 6-12 can gradually remember phrases and simple sequences of numbers and letters. They can temporarily process and remember information in a short time. Their long-term memory is gradually enhanced with the increase of age, and they can remember things and details in daily life.

Children aged 6-12 also have an obvious feature in memory, and they can only remember information that they can understand. Therefore, attention should be paid to giving children appropriate information when designing textbooks to avoid too much or too complicated information. Vision, hearing and movement can be also employed to help them remember, such as drawing numbers or figures with their fingers. Teachers should help them to observe and understand information, not only focus on mechanical repetition.

3.4 Characteristics of Thinking and Imagination

Children aged 6-12 begin to form logical thinking. They can use logical rules to solve problems and analyze the problems more rationally. They have a deeper understanding and perception of the outside world, and they can transform their material of psychological cognition into symbolic expressions. Under the influence of various life and learning experiences, children have formed different thinking modes, showing diversified characteristics. For example, some children are better at spatial thinking, while others are better at logic thinking. As children grow older, their way of thinking will gradually change. Children aged 6-9 mainly rely on intuition and personal experience, while children aged 9-12 pay close attention to logic and reasoning. 6-12-year-old children's critical thinking ability is still in the initial stage, and they have not yet fully possessed the ability of critical thinking, but they have begun to think about the credibility of information. Questions like "Why?" "How?" indicate that children have begun to develop critical thinking.

4 The Optimization Methods of Textbook Design in Line with the Psychological Characteristics of Primary School Students

4.1 Clear and Simple Fonts

Font is one of the most basic elements of visual design. The use of clear and simple fonts helps to enhance primary school students' perception of the text and make textbooks easier to read. Primary school textbooks need to use uniform and clear fonts to ensure the readability. It is not necessary to choose special fonts, but they can also create their own norms and images to improve their interest and closeness when reading. Meet the Preference for Bright Colors.

Color can be effectively used to enhance primary school students' perception of text. Highlighting two or three colors can help create a visually attractive and cohesive design. Colors can also be used to highlight important information or key concepts. Research shows that bright colors are often associated with happiness and positive psychological activities, which can make children have enthusiasm for study, make learning more enjoyable, and help children remember the learning content more easily.

4.2 Adopt Different Illustration Styles

Illustrations are used in textbooks, whose main function is to enhance primary school students' understanding of the text and make the content more attractive. Primary school students' reading habits have always been image-oriented, so integrating different styles of illustrations into primary school textbooks can arouse the interest of primary school students. When designing illustrations for children's textbooks, colorful illustrations, simplified illustrations, realistic illustrations depicting daily scenes that children may encounter in their daily lives, illustrations with bubble dialogs and other forms can attract children and stimulate their curiosity.

4.3 Effective Use of Blank Space

In Chinese traditional art, blank space is considered as the key to create a balanced and harmonious composition. ^[6]Blank space refers to the area around and between design elements, which helps to create visual hierarchy and make the information easier to understand. The effective use of blank space can also give students a sense of "breathing".

4.4 Various Binding Methods

The paramount consideration of textbooks designed for primary school students is the sturdy and durable binding method. For example, spiral binding or flat binding is popular. Secondly, the cover binding that embodies the characteristics of the discipline is considered. For example, in the cover design of Chinese textbooks, we can use the content that can reflect the traditional language and characters of China, use the radical with rich changes as the main body of the image, or hollow out the cover by simulating hollowed-out windows, so as to leave a good impression for children.

5 Conclusions

In conclusion, textbook design in primary school is complex, and the key point is to balance the needs of traditional education system with the needs of providing students with modern information. A good textbook design can be explained as follows: colorful illustrations, clear and easy-to-read fonts, concise contents, easy-to-understand layout, interactive design, and emphasis on stories. In the design process, designers should find a way to present information that is both suitable for culture and attractive to students

According to children's reading perceptual ability at different ages, different levels of textbooks should be designed to meet the learning needs of different students.

References

1. Chen, R. (2021). Research on children's book binding design based on empathy. *West Leather*.08:83-84.
2. Weiwei, M. (2020). The arrangement and design of children's textbooks - Taking Chinese textbooks in primary schools as an example . Xi 'an: Northwest University.
3. Yueyan, X. Chengyu, W. et al. (2018). Comparative analysis of chinese textbooks for primary schools in China and Japan - Taking Chinese for Primary Schools by People's Education Edition and Japanese by Guangcun Book Edition as examples [J]. *Course Education Research*. 02:111.
4. Feifei, W. (2019). Characteristics and enlightenment of the layout design of mathematics textbooks in Chinese primary schools in Malaysia [J]. *International and Comparative Education*. 06:61-67.
5. Han, L. (2021). Research on the redesign of primary school textbook binding by People's Education Press . Harbin: Harbin Normal University.
6. Jin, L. (2016). On the blank space art in the layout design of children's picture books [J]. *Art Education Research*.08:057.

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

