Journal of Positive School Psychology http://journalppw.com
2022, Vol. 6, No. 6, 9085-9090

Lifestyle And Reading Behavior Of Visually Impaired Children In China

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ABSTRACT

Lifestyle and reading behavior in children with low vision was undertaken through the descriptive analysis, target audience interviews together with the qualitative research methods for data collection from textbooks and research literatures relevant to data analysis.

The study found that the book design for low vision children must be based on physiological and psychological characteristics, and cognitive path. In view of reading attention and reading behavior of this captioned children, it was found that at early stage, the children had proficient literacy skills whereas experiences related to learning were accumulated and assistive devices (such as tactile or audio media) were used to cope with reading difficulties.

Keywords: Lifestyle of Visually Impaired Children, Blurred Vision, Reading Behavior, Book Design.

INTRODUCTION

In China, there is a special group of people, such as children with low vision who face the educational problem considerably required to be paid attention. During the past few years, the problems of this captioned people in society have been more apparent and learning and reading problems of the special children have been also increasingly focused. However, there are currently few books for visually impaired children and lack of book design and development. According to the 2010 World Health Organization (WHO) report, there are approximately 75.5 million people who are visually impaired in China. The 2019 Global Vision Report, released in 2019, shows that there are now approximately 216 million people with moderate and severe visual impairment worldwide, and 36 million are blind. Low vision in a moderate to severe level is one of the visual impairment categories extremely decreasing vision and quality of life of patients. China is the largest developing country and it is estimated that there are currently more than 83.2 million people with disabilities, or about 6.4% of the total population, and 12.33millions of them are visually impaired. There are approximately 130,000 school-aged visually impaired children aged between 6-14 of which 79.09% attend compulsory conventional or special schools. For social, economic, science and technology developments, China places an importance on the rehabilitation and education of visually impaired children. In 2016, the first announcement on the "Compulsory Curriculum Standards for Schools for the Blind" was implemented. It includes comprehensive rehabilitation of capability, walking on pathway and the daily life guidelines of students with visual impairments, skills, etc. in order that schools can carry out curriculum studies and rehabilitation, improve learning and self-care abilities of visually impaired students, promote social concentration as well as development of education and rehabilitation for blurred vision children. As books are the most important tools for children to acquire knowledge and experience, those children cannot read them effectively due to their vision impairments and limitation. They therefore have partial vision loss and bad self-independence and have to be attentively guided on learning process and learning path due to limitation of perception. As a result, their cognitive development becomes more outdated than normal ones. Although visually

impaired children are focused as a special group, the educational development in all areas are slowly progressed due to lack of educational resources and guidelines and books remain play a vital role of children' s physical and mental development. In view of childhood education arranged for visually impaired children, most visual design books are based on braille and large-letter books in a single media format. Book design and text design have only one format with no improvement.

The objective of this research therefore aims to seek for solution for blurred children rather than visually impaired ones since the formers lack of proper books and existing ones cannot respond to their reading needs and cognitive development. This research focuses on visually impaired students in terms of their reading difficulty and reading characteristics and indicates a guideline of book design for the captioned children that can improve their reading ability and enhance their cognitive level and imaginative development. Additionally, it also provides theoretical and conceptual basis for designing books for children with visual impairments.

RESEARCH OBJECTIVES

To study lifestyle and reading behavior of the visually impaired children.

LITERATURE REVIEW

3.1 An overview of blurred vision.

It depends on the degree of vision loss. Visual impairments can be divided into two categories: blurred vision and blindness. The term 'Blurred vision' appeared in 1960. In 1973, the World Health Organization (WHO) developed a classification standard for blurred vision and blindness (see Table 1), adopted by most countries in the world, including China. Blurred vision is a visual impairment that cannot be improved with standard refraction correction, medication, or surgery but there remains potential to use residual visual functions for living and working.

Table 1: World Health Organization Visual Impairment Scale

Category	**Level**	**Best Vision Correction**	
		Image sharpness lower than	**Image sharpness is equal to or better than**
Blurred vision	1	0.3	0.1
	2	0.1	0.05 (4 meters index)
Blindness	3	0.05	0.02 (1 meter's index)
	4	0.02	sensitivity to light
	5	no sensitivity to light	

Note: Central visibility is good. but the field of vision is small when the fixed point is taken as the center, Field radius greater than 10° but less than 5° is Grade 3 blind and field radius less than 5° is Grade 4.

3.2 Reading Level of Children with Blurred Vision

As per the research findings, most of them showed that the level of reading development in children with blurred vision was more delayed than that children with normal vision even though both were compared on a similar level of intelligence and educational background. Reading speed, accuracy and comprehension are still behind the average ones. Figure 1 shows the results of international scholars' research on the difference in silent reading speed between blurred vision and normal-sighted children.

The main reason for the delay in reading speed is visually impaired children have difficulty in obtaining visual information from books or electronic screens. Although, they have enough residual vision to serve as the primary sensory pathway for learning. Data obtained from visually impaired children in the survey process was significantly less than from normal vision children. Therefore, children with visual impairments have special characteristics that differ from normal vision children in the process of cognitive and mental development.

Visually impaired children have different psychological characteristics. However, vision still plays an important role in their learning activities. With proper residual vision training (residual vision) and visual assistance, children with blurred vision can learn common words and accomplish many tasks. Moreover, healthy physical and mental development, continuous growth of knowledge and good social adaptation can be promoted.

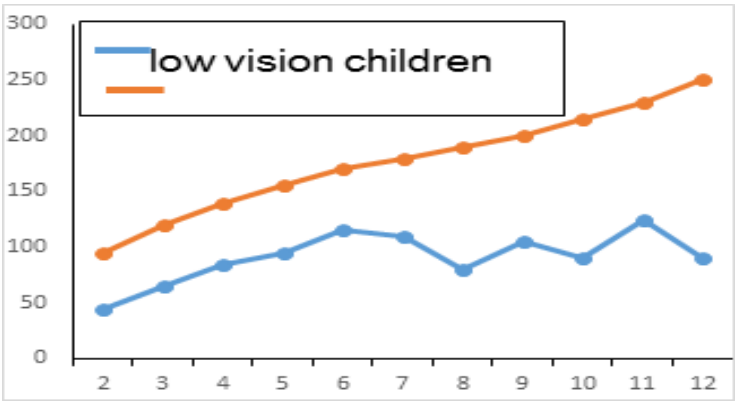

Figure 1: The difference in silent reading speed between visually impaired and group that has the same level of vision

Source: Anne, Corn, Robert, S. Wall, Randall, T. Jose, Jennifer, K. Bell, Karen, Wilcox, Ana, Perez.2002

3.3 Efficient Use of Assistive Devices

Assistive technology equipment also known as assistive devices, mean any item, device, or system, regardless of r being purchased, adapted or custom-made that are used to enhance treatment or improve the functional ability of a visually impaired person. Reading aids equipment plays an important role in the education and life of visually impaired ones. Using vision aids equipment is the most important way to fully obtain the residual vision. Educational equipment commonly used for visually impaired children mainly include visual aids, non-visual aids, electronic aids, and other assistive devices. Different assistive devices have different functions and features. When using these assistive devices, visually impaired individuals should select an assistive device that is appropriate for their actual needs.

Most optical vision aids equipment consist of eyeglass aids equipment, various types of magnifying glasses, near telescopes, etc. (See Figure. 2). Most non-optical audio-visual devices with magnification functions consist of electronic vision aids such as Image magnifying application software for smartphones, etc. (See Figure. 3)

Due to the large screen, large magnification, adjustable contrast and reading mode, an electronic visual effect is significantly better than an optical channel whereas the advantage of using is becoming clear constantly. In addition to visual aids, other educational aids are also massively available and help visually impaired children to learn such as abacus and large-printed calculator, map, thermometer and other voice-activated teaching tools.

Figure 2: Some examples of optical vision aids equipment.

Source: Error! Hyperlink reference not valid.

Figure 3: Some examples of non-optical vision aids.

Source: www.baidu.com, 2021

Practically, what to be focused is a real situation of students with impaired vision. The type and functions of vision aids are varied based on different real situation of reading and reading needs of children that helps improve their reading efficacy and quality of life.

METHODOLOGY

The qualitative research method by descriptive analysis was applied to analyze lifestyle and reading behavior of the visually impaired children. Additionally, review on existing relevant literatures were also made.

4.1 RESEARCH DESIGN

The research content is about the needs of children with visual impairments in reading extracurricular books and how to design books for visually impaired children, analysis and summary of book design elements such as book content type, material, design, color, and media format.

Based on the research objectives and research content, a special education school in Hainan was the center of the investigation. Interviewing teacher and parents of school-aged children with visual impairments was conducted with parents of school-aged children with visual impairments. An analysis of the sample group was made to find out the indicators of demand reflecting required books for current visually impaired children in order to propose how to design extracurricular books for children with visual impairments.

4.3 Research Tools

1. Interviewing teachers and students with visual impairments to understand reading behavior of children with blurred vision, status of books for blurred vision students, and what kind of media used in such books to help develop the cognition of the captioned children
2. Documentaries and literature review related to the cognitive psychology of children, Intellectual development of school-aged children with blurred vision in reading and research on children's book design

4.4 Data Collection

1. **Interview:** The researcher conducted an informal interview with the teachers of the blurred vision students. However, for this research, special books for visually impaired children were in short supply and children with visual impairments could not enjoy comfortable reading. The effect of media used in books on cognition in children with blurred vision were collected by notes taking during the interview.
2. Collection of secondary data on research questions or research objectives from relevant literatures

4.5 Data Analysis

Qualitative Analysis: The descriptive analysis on interview to develop extracurricular reading ability for school-aged children with visual impairments was made to explore guidelines for designing books for children with visual impairments.

CONCLUSION

The findings revealed that in view of reading needs, content types, page layout designs, book styles and materials can determine the design direction of books for children with visual impairments.

Table 2: shows the summary of research data on book design methods for school-aged children with visual impairments.

Reading Needs	Content Type	Page Design	Book Design and Materials
To be more enjoyable	advanced cognition	High increase of color contrast	Big letters
Inclusiveness of visual and auditory functions and other assistive medias	natural science	Type setting of texts and images should be combined with intellectual characteristics.	Security Principles

Based on the above-mentioned data, the medias used for reading was observed systematically and after preliminary decision making, it was found that medias used for reading were required to be continuously evaluated for media performance test and considered whether adjustment and change was required.

Table 3 shows the characteristics of students using textbooks and students using Braille indicating that students with different visual acuity have different reading options.

Table 3: Characteristics of students using various reading medias

Characteristics of Students Using Textbooks	Characteristics of Students Using Braille
- Be effective when in close reading situations - Be interested in pictures and able to specify details of pictures. - Use printed words to complement learning, reading skill and others. - Have stable vision - Have perfect central visual angle. - Visibility is essential for high reading performance and can be continually improve academically on this basis. - There is no further disability impact while using print readers regularly.	- Be likely to perceive by touch - The tactile sensation can be effectively used to identify small objects. - Braille are used to learn other essential reading skills. - Vision is unstable or difficult for making medical predictions to maintain current vision for a period of time in the future. - The center field of view is reduced or the function of vision is insufficient to read the printout effectively. - Touch skill is essential for high reading performance and in academic aspect, it can be built continuously - There is no further disability impact while regularly using a braille reading program.

The differences in student disability levels can lead to differences between physical and mental characteristics, educational needs and learning styles. Consequently, book design based on learning style of children with visual impairments should be undertaken under the following principles:

1. To use a large font book for text reading since the printed fonts are primary mediators of reading. Although visually impaired children can use their remaining vision to read, the fonts in normal books are too small. It is therefore necessary to have books with larger fonts for them.

2. The humane arrangement of text and graphics in designing of books for children with visual impairments is very important. Consequently, designers should adhere to a reader perception when compiling a layout and consider the typesetting of font sizes, font types and line spacing. Normally, the large graphics on the screen tend to be very eye-catching. It is recommended to try to convert complex text data into graphic data with clear characteristics. Coloring and image production should be simplified as much as possible to avoid complex graphics that are difficult to identify.

3. Bright colors enhance practical visual training. Color is also an important part of book design for children with visual impairments. In terms of color selection, combination of high-purity colors having sharp contrast and harmony should be mainly considered.

4. Multimedia in combination with sensory perception: Apart from sight and hearing, touch is also important as a pathway for perception. The tactile and auditory experiences can be integrated into the book design so that paper books for visually impaired children can change the sensory mode of single reading to enhancing diversified sensory experience to assist reading with visual function and improve reading interest as well as learning efficacy

5. Book design mood: The first cognitive psychologist who proposed the idea of emotional design was Donald Norman, stating in his book "Emotional Design" that people's emotional experiences fall into three categories: instinct, behavior, and reflect action levels. These are the theoretical basis for designers to design products that are comfortable attractive and humane. Book design for visually impaired children also makes children 3 types of reaction when reading books. The emotional stimulation of book design for visually impaired children is the design of book material, binding, shape, etc. to stimulate some feeling. Good modelling can therefore make them happy.

6. Focusing on safety: Book designers should pay attention that the books for children with visual impairments are safe enough and also consider child's gripping ability. The book design should not be too thick and the book corner should be stably kept or made from hard materials whereas binding should be handled by various methods. The actual needs of school-age children should be considered and reading difficulties should be minimized.

ACKNOWLEDGMENT

The researcher would like to thank for the wide support of Suan Sunandha Rajabhat University, the Faculty of Fine and Applied Arts and all professors including Asst. Prof. Dr. Akapong Inkuer, Asst. Prof. Dr. Chanoknart Mayusoh, Asst. Prof. Dr. Pisit Puntien, Assoc. Prof. Dr. Rosjana Chandhasa and all concerned with this research. Additionally, thank you for good support rendered by Miss Kanyanee Phuangsua, Miss Chutima Ngampipat, Miss Ammy Malleem and others.

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