Chapter 7
Development of Teaching Materials to Support Learning of Children With Cerebral Palsy in the Japanese Curriculum:
Japan School Initiatives

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ABSTRACT

In addition to bodily dysfunction, about 30 to 50 percent of children with cerebral palsy have various problems in terms of sight and cognitive aspects. For example, sentences that they speak or write are redundant and cannot be summarized. Finding a coherent word or sentence is sometimes difficult for them. It is also difficult to draw a solid on a plane; to recognize the ground from the figure; to capture things while maintaining objective and panoramic viewpoints; to think on the other side. Causes for these difficulties have not yet been elucidated. Teachers are working on effective teaching methods and materials and development for these children's phenomena every day. This study summarizes the practical examples of the teaching materials developed at the school site in Japan and their effects and usefulness.

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INTRODUCTION

About 30 to 50 percent of children with cerebral palsy have some kind of cognitive impairment. Children with severe cerebral palsy are more likely to have cognitive impairment. Like many other aspects of cerebral palsy in children, cognitive impairment requires management.

Cognition is the ability of people to think about problems by using information from the brain. Because cerebral palsy is inherently caused by damage to the brain, centers that transmit accurate information from several sources may be impaired. This means that a person with brain damage will experience difficulties understanding or handling the information he or she receives. When this happens, it is called cognitive or intellectual disability.

Cognitive impairment affects the brain functions such as decision making, difficulty handling emotions, language skills, learning, memory, problem solving, recognition, and speech skills. In addition, often, but not always, anxiety, attention deficit hyperactivity disorder, behavioral disorders, manic depression, fatigue, mutism, and sleep disorders are seen.

In general, there is no single cause of cognitive impairment in children. However, in the case of cerebral palsy, associated brain damage is likely to cause cognitive impairment. The degree and nature of the disorder depend on where the brain damage occurred and its severity. More specifically, cognitive impairment can be attributed to conditions that develop or occur at the stage of the fetus at birth. Sometimes the causal factor is unknown. Several situations can cause cognitive impairment, such as cerebral hemorrhage, chromosomal abnormalities, congenital hypothyroidism, genetic abnormalities, lack of oxygen in childbirth, prenatal infections, preterm complications, and strokes.

A child with cognitive impairment often experiences a delay in language development, depression and anxiety, trouble focusing on difficulties, is prone to distractions, has difficulty learning, experiences literacy challenges, has thoughts that cannot be expressed, and has trouble quickly processing information from "noise." An explosive temper, problems with memory, social ambivalence, trouble interacting with other people, failure to interpret sensory demands, and troubles the other person responds (brain-shrinking plasticity) are possible signs of the problem.

Currently, the benchmark to determine whether a child has an intellectual disability is if the IQ is less than or equal to 70. However, in the profile of the group index of WISC-III, the child with cerebral palsy often shows a reverse-N-character pattern (Kawama, 2008) where VC (Verbal Comprehension) and FD (Freedom from Distractibility) are high and PO (Perceptual Organization) and PS (Processing Speed) are low.

Children with cerebral palsy have many learning difficulties due to the cognitive characteristics. However, the actual state of support is often supported by visually recognizable parts, such as the body and prosthetic devices, and there is little support for parts such as cognitive bias and psychological aspects (Ando et al., 2006). Moreover, the following matters are confirmed in the child with cerebral palsy in the special needs education school of Japan which the authors belong to. Physically handicapped children with cerebral palsy find it difficult to learn plane and space figures due to visual cognitive impairment and to manipulate specific objects due to motor function impairment. Tamaru (2017) has outlined three difficulties in teaching these subjects to physically challenged children (Figure 1a).

The first is the difficulty of the behavior and physically. This difficulty includes upper limb operation, lower limb failure, and difficulty in maintaining stability of the body trunk. Therefore, they do not move with the speed, the strength, and the accuracy desired. The difficulty of controlling movement affects learning.