Chapter 6
Handmade Content and School Activities for Autistic Children with Expressive Language Disabilities

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ABSTRACT

Original teaching materials with dot codes, which can be linked to multimedia such as audio, movies, Web pages, html files, and PowerPoint files were created for use with autistic children with intellectual and expressive language disabilities. A maximum of four audio recordings can be linked to one dot code icon. One of the authors (S. I.) also created "Post-it" icons, on which dot codes were printed, and shared these with teachers of children with Autism Spectrum Disorders (ASD). As part of this project, many activities using dot code materials were successfully conducted at special needs and general schools. Basic information on the creation of these materials and their use in schools are presented in this paper.

INTRODUCTION

Some children with Autism Spectrum Disorders (ASD) do not have the ability to express themselves clearly and therefore, find it difficult to express their needs to others. Consequently, they often become frustrated and treat their classmates and teachers harshly. With the assistance of information commu-

nication technology (ICT) tools, such children are able to communicate their needs. Original teaching materials with dot codes and e-books with Media Overlays were created by the authors, who then conducted activities in schools for students with intellectual and expressive language disabilities. By repeatedly touching a card using a sound pen to hear the sounds, long-term use of these activities has allowed some students at these special needs schools to understand the functions of the dot-coded illustrated cards. Teachers have also assisted these students in acquiring understanding using simultaneous body language and mouthing of the words. Over time, the students were able to learn to select a suitable card from many cards to express their needs to others. The children were at first surprised at the function of the sound pen, but soon understood how this method could allow them to communicate with others. A few students were able to correctly say several key words and phrases necessary for daily life, such as "Good morning!" "Let's eat lunch," and "Goodbye." The dot code activities developed for use by autistic children showed that these original teaching materials and tools, with the associated school activities, were very useful in enriching the students' understanding of words and phrases and improving their speaking ability (Ikuta et al., 2013; Ikuta et al., 2015).

Autistic students are often unable to understand what is going on in their classes at school or pre-school and thus, become frustrated and sometimes panic. Handmade sheets with dot codes developed by the authors were put on the wall in the classrooms, and by touching the sheets with a sound pen; these students could listen to each day's schedule and confirm it with other classmates at the school's morning meeting. Various sheets were also developed for use during classes to assist the autistic students in keeping calm and understanding the appropriate behavior required in class and school.

One of the authors, Shigeru Ikuta (S. I.), from the Otsuma Women's University, Japan, has been involved in organizing a worldwide collaborative research group to develop original handmade teaching materials using advanced ICT tools, and has conducted school activities both at special needs and general schools in partnership with the Japanese companies Gridmark Inc. (Gridmark, 2009), FUSE Network Inc. (FUSE Network, Inc., 2010), and Apollo Japan (Apollo Japan, 2005). The funding provided by the Japanese Ministry of Education, Culture, Sport, Science and Technology and by the Otsuma Women's University has been crucial for the continuation and extension of this important research project.

In this chapter, we discuss the methods for the development of original ICT-based teaching materials, provide guidance on the creation of focused materials, and provide an overview of useful and helpful school activities for autistic students.

Background

More than ten years ago, we started helping students with various disabilities use a sound pen to trace two-dimensional dot codes printed on paper to reproduce sound. Scan Talk code developed by Olympus Co., Japan (Olympus, 1999) was first used, in which the voices/sounds were encoded and printed directly on paper as two-dimensional dot codes. To reproduce the voices and/or sounds, the students had to trace the fairly long dot codes with great care using a Scan Talk Reader and Sound Reader.

Use of this first system demonstrated that it was a very powerful tool for students with disabilities, as the specially designed software could be used to create original handmade teaching material focused on individual needs and desires, was easy to use, and was free of charge for schools. However, some mentally and severely hand- and finger-challenged students at special needs schools were unable to trace the long,

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