


## Chapter 7

# School Activities for Autistic Children Using Newly Developed Software and Tools

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### ABSTRACT

*Original teaching materials with dot codes were created for use with autistic children with intellectual and expressive language disabilities. One of the authors (S. I.) created “Post-it” sticker icons on which dot codes were printed and shared these with teachers of children with autism spectrum disorders (ASD). Each sticker icon was linked with up to four multimedia mediums of expression, such as a movie, in addition to up to four voices/sounds. Touching a dot code icon with a speaking-pen enables audios to be replayed, and touching a dot code icon with a dot-code reader with Bluetooth functionality enables multimedia to be replayed on iOS and Windows OS devices. New software to create self-made teaching materials with dot codes was developed by Gridmark Inc., with the help of author S. I. Basic information on creating original teaching materials using this newly developed software and its use in schools for students with ASD are presented in this chapter.*

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## 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. Autistic students are often unable to understand what is going on in their classes at school or preschool and thus, become frustrated and sometimes panic. With the assistance of information communication technology (ICT) tools, such children are able to more easily communicate their needs.

Original teaching materials with dot codes were created by the authors, who then conducted activities in schools for students with ASD and expressive language disabilities. Self-made sheets with dot codes, developed by the authors, were mounted onto classroom walls. By touching the mounted sheets with a speaking-pen, students could listen to each day's schedule and confirm it with other classmates at the school's morning meeting. Various self-made sheets were also developed for use during classes to assist autistic students in remaining calm and understanding the appropriate behaviours required in class and in school. The school activities for students with ASD and other disabilities were described in detail in chapter papers recently published by IGI-Global (Ikuta et al., 2013; Ikuta et al., 2015; Ikuta et al., 2017; Ikuta, 2018; Ikuta et al., 2019a; Ikuta et al., 2019b; Ishitobi et al., 2019).

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 self-made teaching materials using advanced ICT tools, and has conducted school activities both at special needs and general schools in partnership with the Japanese company, Gridmark Inc. (Gridmark, 2009). 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, the authors 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 recently performed.

## BACKGROUND

More than 14 years ago, author S. I. began helping students with various disabilities use a tool to trace two-dimensional Scan Talk dot codes (Olympus, 1999) printed on paper to reproduce sound. Some mentally and severely hand- and finger-challenged students at special needs schools were unable to trace the long, straight, Scan Talk codes correctly and were, therefore, unable to join in with class activities. Therefore, as teachers, the authors sought alternative systems so that students could easily touch the dot codes with a sound (speaking) pen to reproduce the voices/sounds clearly, which would allow a greater number of disabled students to learn to use the dot code content. Author S. I. began collaborating with a company, Gridmark Inc.; Gridmark Inc. had originally developed the Grid Onput dot codes (Gridmark, 2009) in which a maximum of four multimedia mediums, such as movies and audio recordings, could be linked to each dot code symbol icon. With the assistance of author S. I., Gridmark Inc., developed easy-to-handle, non-commercial software (*Sound Linker* and *File Linker*) and provided the software programs to schoolteachers free of charge, meaning they could create their own original content.

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