

## Chapter 106

# School Activities with New Dot Code Handling Multimedia

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### ABSTRACT

*The authors use a new communication aid in conducting many activities at preschools, special needs schools, and general schools. They use dot codes printed on paper and linked with multimedia such as voices, sounds, movies, Web pages, html files, and PowerPoint files. More than one audio file can be linked with a single dot code, and other multimedia files can be further linked to the same dot code in addition to the audios. Just touching the dot code with sound pens (Speaking Pen and G-Talk) can produce the original voices and sounds clearly. If a G1-Scanner pen is connected to a tablet or a personal computer, the multimedia can be replayed on its screen. This chapter reports recent advancements in software used to create handmade teaching materials as well as several case studies from preschools, special needs schools, and general schools.*

### ORGANIZATION BACKGROUND

One of the authors (S. I.) organized the dot code research project (now involving nearly 20 school teachers) in 2005, when he was on the faculty of the Education Bureau of Laboratory Schools, University of Tsukuba. The Education Bureau has 11 laboratory schools, of which six are general and five are special needs schools. He started the research project to help laboratory school teachers promote fruitful school activities by creating *original handmade teaching materials* with sounds and voices. He was also the leader of a regional research community of teachers in the Hachioji and Tama cities of Tokyo, unify-

DOI: 10.4018/978-1-5225-0034-6.ch106

ing two groups into one skillful, competent group. Researchers from outside the Tokyo area have now joined the project. Teachers from the School for Young Children at the University of Saint Joseph in Connecticut are actively co-researching with their Japanese counterparts. After S. I. moved to Otsuma Women's University, the students there also became involved in creating original handmade teaching materials and conducting school activities at both the special needs and general schools.

To support the individual needs and desires of each student, creating *original teaching materials* is essential. The authors have been developing *original handmade* teaching materials that can pronounce voices and sounds by “reading” and interpreting the dot codes printed on paper, and have been conducting many school activities for students with various challenges and abilities at special needs and general schools.

The authors have held workshops three or four times a year, as well as a symposium to present research progress to the public at the annual conference of the Japanese Association of Special Education.

Financial support was given to one of the authors (S. I.) by the Japanese Ministry of Education, Culture, Sports, Science, and Technology and by the Institute of Human Culture Studies at Otsuma Women's University. Software and hardware for this project are developed with these funds. Continuous support by the developer, venture business company Gridmark Inc., has been essential.

This chapter describes recent advancements in software and hardware of a new dot code system (GridOnput) that can handle multimedia such as movies, web pages, html files, and PowerPoint files in addition to audios. It also offers insight into the development of original handmade teaching materials and reports on recent interesting activities utilizing this new communication aid at preschools, special needs schools, and general schools.

## **SETTING THE STAGE**

Several companies have developed “sound pens” that use dot code technologies in which touching printed matter with dot codes can reproduce original sounds and audios. One such business, Afaya Co. Inc. (Afaya Co. Inc., 2005), offers various types of sound pens (Afaya Co. Inc., 2005); with its business partners, Afaya creates and publishes contents using dot codes. The company recently produced label sheets with dot codes that can be linked with the recorded voices in a sound pen that has a voice-recording functionality.

Franklin Electronic Publishers, Inc. developed AnyBook (Franklin Electronic Publishing, Inc., 2013), a “magic” reading pen that enables words and pictures to “talk” using vocal recordings with any book. The company sells sound pens and unique reusable stickers that users can link with their recorded sounds. The most sophisticated sound pen, DPR-5100, holds up to 200 hours of recorded audio. Unfortunately, these systems can link only one audio to each dot code printed on the paper or sticker.

The present authors first used the Scan Talk code developed by Olympus Corporation (1999), which can be printed on ordinary paper; tracing the dot codes with the Sound Reader tool reproduces the original voices and sounds clearly. However, some students in lower grades at general schools and with severe hand/finger challenges at special needs schools could not trace the Scan Talk codes correctly, and therefore could not join their classmates in all activities. These initial-stage research works were described in detail in a recently published book (Ikuta et al., 2013).

The new dot code system that can handle multimedia, presented in this chapter, has proven very useful for students with various needs and abilities, including gifted and talented students who desire and

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