

Chapter 4

Original Teaching Materials and School Activities With E-Books Containing Media Overlays

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ABSTRACT

Original e-book teaching materials containing media overlays were created for use in teaching students with reading disabilities. FUSEe developed by FUSE network, Japan was used to create EPUB 3 e-books, where an audio was replayed with synchronized highlighting of the corresponding text. SMIL language or JavaScript package for iOS, ibooks.js was used to replay the audio reproduction. These EPUB 3 e-books were read effectively with an EPUB 3 reader (for example, iBooks for iOS, and Sony and Kobo Readers for Android). E-books created with special needs school, general school, and Japanese Foreign Language Institute schoolteachers were implemented at many schools for students with reading disabilities and dyslexia. Some assessments of the reading activities were performed to clarify the e-books containing media overlays. Basic information regarding the creation of these e-books and their use in schools is presented in this chapter.

DOI: 10.4018/978-1-5225-6240-5.ch004

INTRODUCTION

There are many reasons why students may struggle in the classroom. As educators and parents look for ways to help children, they often find that there are undiscovered learning disabilities that interfere with learning. These disabilities know no cultural or geographical boundaries. The identification of students with special needs may vary, but the overwhelming need for understanding of best educational practices does not change. One country that has a large interest in education for their special needs students is Japan.

In Japan, there are 1,135 special needs education schools, and about 142,000 students are enrolled and nearly 84,000 teachers work there. Of these schools, 553 schools are for students (91,083 students) with intellectual disabilities; 122 schools are for students (3,465 students) with physical disabilities; 86 schools are for students (4,805 students) with hearing impairments; 62 schools are for students (1,992 students) with visual impairments; 57 schools are for students (2,367) with health impairments; and 255 schools are for students (38,233 students) with multiple disabilities (Statistics Japan, 2017).

Although it was pointed out by the Ministry of Education, Culture, Sports, Science and Technology—Japan (2016) that about 6.5% of all the students at general schools have learning difficulties, some of the teachers usually feel that *more than* 6.5% of all the students in their class have some learning difficulties including reading disabilities. Such teachers sometimes have difficulties in teaching and managing their classes. In almost all of the general schools, there are classes for special needs education and classes for students with language and speech disorders, hearing, speech impediments, articulation disorders (including stuttering), etc.

Reading disorders occur when a person has trouble with any part of the reading process. Reading and language-based learning disabilities are commonly called “dyslexia.” These disorders are present from a young age and usually result from specific differences in the way the brain processes language (National Institutes of Health, 2017). Children with dyslexia have trouble reading accurately and fluently. They may also have trouble with reading comprehension; spelling; and writing. Dyslexia is a lifelong condition that makes it difficult for people to read (Lapkin, 2016).

Some students who are mentally challenged also have reading disabilities with ambiguous pronunciation and expressive language difficulties. For those students with hearing impairments, it is very difficult to pronounce the words and phrases clearly and fluently. Almost all children with Autism Spectrum Disorder (ASD) do not have the ability to express themselves clearly and therefore find it difficult to express their needs to others (WebMD, 2016; National Institutes of Mental Health, 2017). Consequently, they often become frustrated and treat their classmates and teachers with anger. Up until now, for those students with reading disabilities, DAISY Digital Talking Books have been widely used with Windows personal computers; and recently, DAISY features have been integrated into mainstream EPUB 3 standard (International Digital Publishing Forum, 2011a; International Digital Publishing Forum, 2017a); now, students can read some DAISY books on iOS devices equipped with a specially-designed application.

EPUB 3 (the latest format for representing document in electronic form), the third major release of the standard, consists of a set of four specifications: EPUB Publications 3.0, EPUB Content Document 3.0, EPUB Open Container Format (OC) 3.0, and EPUB Media Overlays 3.0 (International Digital Publishing Forum (IDPF), 2011b), each defining an important component of an overall EPUB Publication. By using these four sets – including the International Standard key technologies like XHTML5 (W3 Schools, 2012a), CSS3 (CSS3 Introduction, 2012), JavaScript (W3 Schools, 2012b), and SMIL3 (World Wide Web Consortium, 2008) – users can now fairly easily create their own eBooks containing media overlays like a read-aloud option for reading them with their tablet and smartphone like the iPad and

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