

## Chapter 57

# Educational Applications as a Support for Reading Disability at Elementary School

**Jaime Muñoz-Arteaga**

 <https://orcid.org/0000-0002-3635-7592>

*Universidad Autónoma de Aguascalientes, Mexico*

### ABSTRACT

*Reading is an important competency to be developed for children in the first years of elementary school. Reading becomes a mechanism that allows the children to interact with the world and identify their characteristics. Dyslexia is one learning disability frequently manifested in elementary school, and to identify it, teachers require extra educative resources, in particular educational applications. This work proposes a process model to design and develop educational applications considering the learning needs of children with dyslexia. It involves a user-centered approach because different perceptions of several actors are considered. The performance of the proposed model is explored in a case study and an evaluation, taking into account usability and accessibility factors.*

### INTRODUCTION

The educational applications also known as educational apps, they are interactive applications that promote the use multimedia content notably under mobile devices easy to use beyond the classroom walls in the education in schools (Ciullo et al. 2018). The software for this educational application encompasses a variety of forms, platforms, and purposes. These applications can be used in several domains for example to teach individual letter names, phonics and grammar in a certain language (Dore et al. 2019). Other educational applications introduce mathematical concepts for all grades or are aimed at helping to develop logical skills (Herro 2013). Nowadays, the elementary school has created inclusive programs in order to offer educative support for children with learning disable such as dyslexia, dysgraphia, and dyscalculia (Zikl 2015) (Uloyol & Sahin 2014). These children require an efficient learning method,

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teachers using educative resources can innovative teaching methods specific to the context of children so that even they motivating differently and can be self-paced learning at the level that corresponds to their chronological age (Ciullo et al. 2018) (Mize et al. 2019a).

Nowadays, the elementary school has been created inclusive programs, which are dedicated offer support for children with learning disable such as dyslexia, dysgraphia, and dyscalculia (Zikl 2015). This work is interesting in the study of dyslexia; this is a specialized term for a specific set of traits in the reading process that it falls under the general category of specific learning disability in reading. Someone with dyslexia may be identified with disabilities in basic reading skills, reading comprehension and reading fluency as dyslexia often affects all three aspects. Individuals with specialized training can offer remedial techniques for dyslexia in a highly structured, multisensory approach to teaching reading.

This work is interested in the study of dyslexia; this is a specialized term for a specific set of traits of reading disability. Dyslexia is related to reading difficulties frequently identified at elementary school (Cook, L. & Dakin, K. 2007). Some of most common learning difficulties related to dyslexia are: mis-understand words with similar pronunciation, poor reading comprehension, slowness in reading, difficulty identifying the letters, delay to memorize the numbers, the alphabet, the days of the week, colors and shapes. These kind of difficulties in general affect the academic performance of a child (Turner & Greaney, 2009), arising several learning issues that are reflected in behavior, socialization, academic desertion among others (Tamboer et al., 2016). A teacher at elementary school spends time to prepare educational resources and it becomes difficult to find specific educational content as a support to reading disability. The instructional design for teaching reading for children with dyslexia requires to prepare additional educational applications in order to help the students to achieve their learning needs and these strategies can be incorporated into the child's education.

An alternative solution is the use of educational applications as educational content to help reading according to the learning needs. In general, children at the school can use several technological resources as complementary support for learning activities, then children with learning disabilities require a larger diversity of resources in order to support the acquisition of knowledge (Dore et al. 2019) (Gaggi et al. 2012). In addition, when there are groups with a large number of students for the teachers are not always possible to offer a personal teaching. Then, the interactive applications can be an efficiently support to mitigate some issues of learning problem in particular for reading.

Teachers can use their educative material accompanied by educational applications to gain visual interactive communication with the children and a greater understanding of what they are being taught. The cognitive processes of children with learning disability is taken into account in attention, memory, perception, and language and, on encountering a word and images that represents a certain concept; these can help to process the symbols and letters, extracting characteristics such as shape or position and the sound of the words by the verbal processing code (Quispe et al. 2017). The process at the cognitive level can be positive, since the children try to recognize, find and analyze information. The student is motivated to continue to have a better understanding of word using friendly and accessible user interface of an educational application as seen in the assessment carried out on evaluating a set of learning activities (Chelkowski et al. 2019).

The software production for educational applications does not necessarily have to start from scratch, it can be used standards that guide the construction of the product, some of these alternatives can be achieved through the partial representation of information, or by using efficient abstractions that can be applied to describe different approaches to software development (Somerville 2015). This paper proposes a software process model to develop educational applications to be used for teachers as a useful

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