Chapter 12
Mobile Technology of Learning and Communication for Students With Disabilities

Sayaka Matsumoto
Otsuma Women's University, Japan

Kuniomi Shibata
 https://orcid.org/0000-0002-1747-155X
Tsuda University, Japan

Akira Hattori
Komazawa University, Japan

ABSTRACT

This chapter presents a mobile application to support children and students with hearing difficulties and/or developmental disorders in interacting, understanding, and preparing for learning in their daily, school, and social lives. The authors think that a learning and communication support technique using a combination of characters, pictograms, and photographs is effective for people with disabilities. The application recognizes words spoken by their communication partners by using a speech recognition system and arranges the pictures corresponding to the words in a sequence. The results of two demonstration experiments show that PICTONGUE promotes mutual understanding between students who have hearing difficulties and/or developmental disorders by utilizing pictograms and photographs in combination with speech. The authors suggest that PICTONGUE supports visualization and feedback for planning and learning as a new way of communication for children and students with hearing difficulties and developmental disorders.

INTRODUCTION

The authors focused specifically on hearing and developmental disorders, and they think that a communication support technique using a combination of characters, pictograms, and photographs is an effective aid for people with disabilities. It has already been established that visualization of a schedule and feedback regarding one's performance of it are helpful parameters. Using the communication support application that one of the authors has developed, the user is able to set a goal for himself. This makes it effective for most learners, including those with hearing or developmental disorders. Visualization and feedback of a schedule or action can effective for the gifted children.

BACKGROUND

Even though differently abled people can often think very clearly, they experience difficulties in expressing their thoughts and intentions, with verbal and nonverbal communication being a major challenge. Gaining an understanding by listening to a conversation is difficult for people with hearing disabilities. Moreover, people with developmental disorders have difficulty in grasping the context of a conversation. Even planning daily actions can be challenging. For instance, the following thought process is considered "natural" for most people:

"I need to go to school today. Therefore, I must wash my face by 7:30 am and finish eating my breakfast by 8:00 am."

However, people with disabilities often cannot think like this. When an unplanned incident occurs, panic overwhelms their faculties, and they dread the prospect of taking subsequent action. Such obstacles hinder their fundamental day-to-day actions such as learning and communication and interfere with their analytical skills and execution capabilities, often resulting in responses inferior to their actual capabilities. These factors have a negative influence on their self-confidence and interpersonal relationships and affect their self-esteem in the long term; they create a downward spiral in personal development, lowering the quality of life for differently abled people and simultaneously inconvenience the support staff and people around them. If these problems can be solved, people with disabilities will be equipped to be much more successful in their pursuits.

So far, the authors have investigated problem creation as a topic for discussion in relation to a person with disabilities. Meanwhile, mobile technology has revolutionized our lives. Most smartphone users use applications to support communication and a majority of them are text-based. Because it is difficult for us to express our feelings solely via text, the use of decorated letters and photographs has already been implemented. Various tools for communication support have been developed, as applications can currently be developed by anyone, even on a small budget.

As the mobile phone is a useful tool for people with disabilities, a basic application that targets this group of people was developed.

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