Chapter 2

An Assessment of Eye Tracking as an Educational Aid for People with Profound Multiple Learning Difficulties (PMLD)

J.A. Renshaw
Leeds Metropolitan University, UK

B. Boullier
Hollybank Trust, UK

S. Geddes
Hollybank Trust, UK

A. Moore
Hollybank Trust, UK

ABSTRACT

This chapter describes a series of trials designed to assess the feasibility of using an eye tracker as an aid to the teaching of symbol recognition to those with profound multiple learning difficulties (PMLD). The study was funded by the Esmee Fairbairn Foundation under their “Hard to Reach” programme and was a collaborative venture between Leeds Metropolitan University and the Holly Bank Trust. The chapter demonstrates how an eye tracker can be used to provide, in real time, accurate and relevant information as to where a participant diagnosed as having PMLD is looking as they search for frequently used symbols. The authors conclude that the system has the potential to provide teachers, carers and parents, with a richer way of communicating and gives instantaneous feedback on symbol recognition performance thereby enabling teachers to change their teaching strategies if required. The study also yielded quantitative evidence of performance improvement and the authors propose a methodology for the use of this data to assess a participant’s performance against a proposed national standard.

DOI: 10.4018/978-1-61350-183-2.ch002
INTRODUCTION

Non-disabled people can use several channels through which to communicate their wants, express an opinion or describe an idea. They can communicate verbally, through facial expressions and/or with gestures and body language to convey to others at least the gist of what they want. The basic skills to do this are acquired during childhood and are honed with varying degrees of success throughout the rest of their lives. People diagnosed as having PMLD are prevented from achieving the same levels as non-disabled people because of their disabilities but their needs and ambitions may be very similar to those of their non-disabled counterparts (Mencap, (n.d.), United Nations, n.d.).

This chapter describes the use of eye tracking technology to facilitate the learning of symbols through the use of which the limitations imposed by disabilities can be at least partially ameliorated. The approach belongs to a group of techniques known as augmentative and alternative communication (AAC) (Augmentative Communication in Practice, 1998). Eye pointing is the name given to the technique in which a person fixates on a particular area of interest or object to indicate its selection (Augmentative Communication in Practice, 1998). Symbols, usually cards with representations of objects on them are commonly used as a way of exchanging thoughts, feelings, information and to indicate choice. Their use is usually accompanied by a simple verbal description of the symbol (Augmentative Communication in Practice, 1998, Schlosser and Sigafoos, 2006).

The current methodology of assessment, as to how well a person with PMLD learns to use the eye pointing technique, is for the person to whom the communication is directed, to assess the direction of the gaze and guess the target. The assessor’s skill in doing this varies and is subjective. Despite their closeness to the person, opinions on how well a learner is doing, may vary amongst those charged with the person’s care. This subjectivity and the lack of objective, quantitative data may adversely impact upon the person’s education and assessment and may lead to delays in their progression or lead to inappropriate decisions as to the next step in their education programme (Augmentative Communication in Practice, 1998, A guide to communicating with people with PMLD, n.d.).

At the suggestion of the parents of a young girl with Rett syndrome (RS), researchers at Leeds Metropolitan University and the Hollybank Trust decided to explore the feasibility of using eye tracking technology as an assessment tool. The aim was to ascertain whether it could be used a means of providing information to carers as they taught children and young adults how to read and use symbols. The system had the potential to provide a convenient and readily accessible way to record a student’s progression and could provide an objective record of achievement.

BACKGROUND: REVIEW OF RESEARCH AND WORK DONE TO DATE

Profound Multiple Learning Difficulties

People with PMLD have more than one disability, profound learning and communication difficulties; their medical and health requirements may be numerous and complex. They need help all their life (Mencap, n.d.). Whilst children are protected by the UN Convention on the Rights of the Child (Article 13) there is less overt protection for adults with PMLD but they too must have the same rights as non-disabled people to be heard and to be able to communicate.

Emerson (2009) estimates that in 2008 there were just under 15,000 children under the age of 18 years and 16,000 adults with PMLD and that these populations would grow at the rate of 1.8% on average in the period 2009-2026.
Related Content

Game-Based Learning in Teacher Education: A Strategy to Integrate Digital Games into Secondary Schools
Nathalie Charlier and Bieke De Fraine (2012). *International Journal of Game-Based Learning* (pp. 1-12).
[www.igi-global.com/article/game-based-learning-teacher-education/66878?camid=4v1a](www.igi-global.com/article/game-based-learning-teacher-education/66878?camid=4v1a)

Understanding Graduate Students’ Intended Use of Distance Education Platforms
[www.igi-global.com/chapter/understanding-graduate-students-intended-use/54163?camid=4v1a](www.igi-global.com/chapter/understanding-graduate-students-intended-use/54163?camid=4v1a)

Collaborative Learning On-Demand on the Internet Mbone
[www.igi-global.com/chapter/collaborative-learning-demand-internet-mbone/30603?camid=4v1a](www.igi-global.com/chapter/collaborative-learning-demand-internet-mbone/30603?camid=4v1a)

Using Formal Game Design Methods to Embed Learning Outcomes into Game Mechanics and Avoid Emergent Behaviour
[www.igi-global.com/article/using-formal-game-design-methods-to-embed-learning-outcomes-into-game-mechanics-and-avoid-emergent-behaviour/182563?camid=4v1a](www.igi-global.com/article/using-formal-game-design-methods-to-embed-learning-outcomes-into-game-mechanics-and-avoid-emergent-behaviour/182563?camid=4v1a)