

# A computer supported learning environment to support pupils with cognitive disabilities and their teachers

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**Abstract:** Although there is no doubt that computers are highly capable to provide pupils with cognitive disabilities in learning we observe an immense lack of professional learning software for this target group. There are few products designed by special education teachers with a high level of instructional design but at a low technical level, unflexible and not adaptable. In contrast there are loads of colorful animated commercial products, mostly designed for primary school pupil and often with absence of any instructional quality. In our project we want to overcome these problems by developing a learning platform which meets the needs of both, the pupils with cognitive disabilities and their teachers. In this interactive presentation will present an overview of this platform and give some examples of good practice as well as latest results of an ongoing study about facilitating communication between pupils with cognitive disabilities using a CSCL setting.

## Introduction

The use of computers for people with cognitive disability has been described as very efficient for several years. It has already been described very early by Zellmer (1976) that computers help to elevate concentration, makes variation of learning subject for different pupils easy, could provide immediate feedback to and encourage of pupils after every step, enables access to information even for people who cannot read because of the possibility of multi-media representation (pictures, sound) and offers multiple ways of input, e.g. by touch-screens.

In addition, working with this medium supports the increase of self-determination, of independence, and integration skills (Wehmeyer, 1998) and allows for “positive changes in inter- and intrapersonal relationships, sensory abilities and cognitive capabilities, communication skills, motor performance, self-maintenance, leisure, and productively.” (Parette, 1997). Jeffs, Morrison, Messenheimer, Rizza & Banister (2003) say that “The introduction of the computer as a teaching tool ... can be viewed as the greatest agent of change ... for individuals with mental retardation.” And Zentel, Opfermann, & Krewinkel (2007) showed that a Computer can be used as an effective learning tool to support the acquisition of basic learning skills.

Regardless this long history of positive results in research on computer supported learning for pupils with cognitive disabilities, special-needs teachers are complaining a lack of software which can be easily adapted for individual needs of a heterogeneous group of pupils.

## Learning Platform

In our project the main objective in developing a computer supported learning platform is to integrate the computer into daily teaching and learning practice of schools for pupils with cognitive disabilities. This means that our software must be easy to use and fulfill even requirements of teachers with very low technical capability. Furthermore, while being used in the classroom the software must appear as a tool supporting pupils in existing learning procedures. Finally, the fact that a teacher uses computers should not make it mandatory to change the way of teaching and learning.

In our project we want to realize these goals by the approach of complementary action design (Lingnau, Harrer, Kuhn & Hoppe, 2007), bringing together teachers for children with cognitive disability, computer scientists and psychologists. Their complementary expertise led to a description of how needs for a software environment for pupils with cognitive disabilities should be implemented in an innovative software environment. Besides we try to find and elaborate design patterns which can be generalized for computer enriched settings and learning environments for pupils with cognitive disabilities.

## Interactive Presentation

In this interactive event presentation we would like to address teachers and researcher and demonstrate both, the teachers' and the learners' perspective of the system (Figure 1). We will show how teachers can designing individualized tasks and learning scenarios for pupils with cognitive disabilities and manage the pupils' learning content. We will show how activities within the system and learners' interaction are logged and used to analyze the learners' skills and process of task solving.

Furthermore, participants will get an opportunity to put themselves in the position of a learner to get an overview of the specially developed user interface and its functionality. Here the learner will be guided while interacting with the system, will find his or her individual tasks and get sophisticated support if needed.

Finally, we will present the modified technical setting for and latest results of a computer supported collaborative learning task (Lingnau, Zentel & Cress, 2007). In an ongoing study we have enhanced our first setting trying to encourage verbal communication between pupil with cognitive disabilities while trying to solve a computer supported collaborative task in a distributed face-to-face setting.

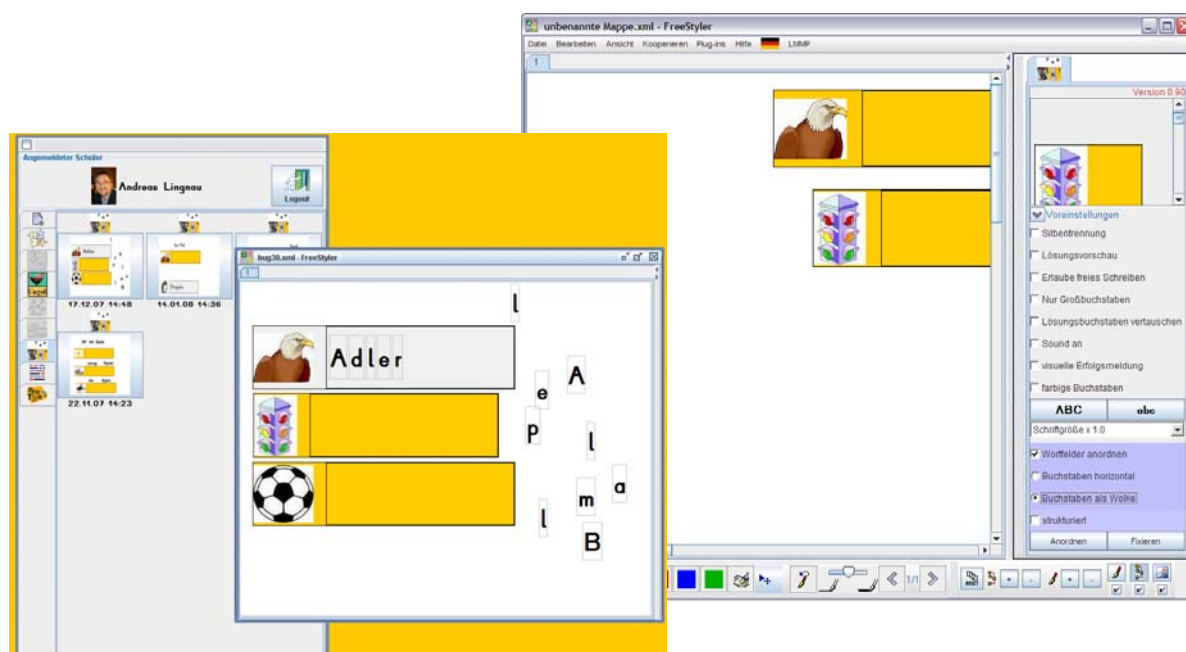


Figure 1. A writing task generated in the teacher interface and processed on the learners' desktop.

## Objectives

Apart from presenting and discussing our current work with a wider audience we would like to bring together people with different backgrounds interested in the field of special education to foster networking of and exchange between researchers and teachers in the field of computer supported learning for pupils with cognitive disabilities and learning difficulties.

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