An Interactive Courseware to Teach Mathematics for Children with Hearing Disabilities

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Abstract— **This paper describes an interactive learning CD-based courseware that has been developed to assist school teachers using an effective approach to teach mathematics to special students in particular, hearing impaired students. As such, it overcomes the limitations of current e-learning systems that tend to ignore marginalised groups such as the disabled. A courseware module has been introduced to teach numbers, counting and basic mathematical operations to deaf students aged 7-10 years old. Students are able to learn sign language whereby animations, graphics, audios and videos are integrated to create the signs. Unlike traditional method of teaching; which tends to be teacher-centred and student remain as passive recipients; students are kept actively involved in the learning process and the teacher acts as a guide to facilitate their learning. Interactive activities and multimedia games are among the extra features that are employed allowing teachers to measure their students' comprehension. The courseware has been experimented for teaching in a local school for the hearing impaired. Teachers provide positive feedbacks after implementation which shows that the courseware could be a potential assistive tool to teach this special group of students.**

Keywords- Courseware, hearing disabilities, interactive learning.

I. INTRODUCTION

Access to education for the deaf and hard of hearing is no longer possible, as more students attend school that provides special education to cater their learning needs. Thus educators felt there is a need to have an access to interactive teaching materials in order to encourage effective learning. However interactive education requires a great deal of creativity from teachers to develop interactive approach. Therefore the integration of multimedia elements into the teaching material believe to be more effective compared to traditional teaching methods [1].

To promote interactive teaching and learning environment, a computer based learning such as courseware, educational software and e-learning are powerful tools that could change in which students consume education. It is also shift how students opt to learn based on their learning needs [2]. In order to increase the accessibility of teaching software for hearing impaired people, these characteristics must be put into account [3]; a) provide visual form of all audio information, b) prepare captions in all multimedia presentations, c) ensure all visual cues are made aware to user although user does not see it on the screen, d) attract user by emphasize the significant information.

Multimedia elements and environments can provide multiple representations of concepts that are more meaningful to students who are deaf or having difficulties on hearing [4]. Interactive education is important as it provide more understanding to deaf and difficulties on hearing students. This can be achieved by integrating it with the experiences of the students or by using actual practice. Animation is deemed the most enjoyable features for younger age deaf students [5].