Item	Content
Introduction	The presented system is developed in the context of the AILB-project (Aachener Internet- Lernsoftware zur Berufsqualifizierung von Gehörlosen) supported by the Federal Ministry of Health and Social Security. The aim of the AILB project was to develop a bilingual web based learning system for deaf adults who want to maintain and improve their mathematical and reading/writing skills. In this project, the special needs of deaf learners were taken into consideration, as e.g. bilingual information (text and sign language), a high level of visualization, interactive and explorative learning, and the possibility of learning in peer groups via video conferencing. AILB is a joint project of Aachen University (content development), Fraunhofer Institute for Applied Information Technology FIT (software development), and bureau42 GmbH (specification and consulting). To be more specific, the project presented a learning management system (LMS) which offers German Sign Language videos in correspondence to every text in the learning environment. The pilot study started with 20 deaf people at a vocational training center in Leipzig. The deaf have been introduced to the LMS AILB by one deaf and one hearing researcher from Aachen who was present to answer questions for several days. During the pilot study, the deaf students used the Learning Management System (LMS) at fixed times at the vocational training center. They were expected to go through a prescribed set of lessons and have recourse to a teacher in case of problems. This ensured a fixed frame for all students who were not used to or who were not capable of self-directed learning. The results of the first evaluation, which included the learning process and progress, the intrinsic and extrinsic motivation, and the learners' self-assessment, have been used for the further development of the concept and the learning environment. In detail the AILB system provides the following features: · GSL is used as the language for explanations. The use of GSL in the AILB software, however, is not confined to a mere translation of the German texts but the GSL videos are adapted by deaf researchers to the needs of the deaf user, the modalities of GSL, and the Deaf culture. This aims at improving the mediation of the content and serves as a strategy to enhance the learners' motivation. · Wherever possible, the content is clarified by special forms of visualizing structures and processes. This is very important with a group of learners who are strongly visually oriented due to the mediality of their language, i.e. sign language. · Video conference and chat rooms enable learning in peer groups and help building a learning community.
Type of institution involved	Higher Education Institutions (HEIs) and Vocational Training Center
Title of the methodology used	An e-Learning Environment for Deaf Adults
Type of educator	Adult Educators
Tool/tools used	Multimedia including digital video, videos, e-learning platform
Main Challenges, Key Success & Enabling Factors	The reading/writing and mathematical skills exhibited by deaf people are well below that of hearing people, although their mental capabilities are basically the same. These results were obtained in the project ATBG. The AILB-project took exactly these findings as point of departure. The main reason for the huge discrepancy between the skills of hearing and deaf people is due to in the socialization of the deaf. In Germany most deaf children have hearing parents who have little or no command of GSL. This means that during the critical period of language acquisition, i.e. from the age of 2 to 7 years, the deaf child has little to no exposition to GSL. For most deaf people their first contact with GSL is in school during break with their deaf peers. This fact plus the inaccessibility of information through radio and television (due to few subtitles) turn into a vicious cycle which is difficult to break. Without a fully developed first language – spoken language cannot be acquired due to deafness and GSL cannot be acquired due to the lack of exposition – learning how to read and write becomes an almost impossible task to master. Therefore reading level of young deaf adults is comparatively low, namely at the level of hearing fourth graders. This makes book learning nearly impossible. However, the ability to read is regarded as a key skill, which serves as a prerequisite for the expansion of knowledge– inter alia in the areas of writing and mathematics. This coherence was confirmed by the PISA study, that shows that students with good reading competence are also good at mathematics. Based on these problems and findings the LMS was adapted to the specific learning problems of the target group, i.e. deaf adolescents and young adults. Essentially, this software presents a specific after-school enhancement for the preparation for working life. The provided content is bilingual. Bilingual experiments (spoken and signed language) in schools for the deaf and hearing impaired have shown that the use of sign language in the classroom furthers reading competence significantly. The content does not resort to a systematic building up of language but employs a functional approach, i.e. working with texts and tasks which are oriented at everyday life and demands and not merely drill the learners. Above and beyond that, the learners are introduced to working with references and dictionaries. One main objective of AILB was enhancing self-directed and explorative learning. The learners found guidance and were introduced to strategies which supported these methods of learning. Therefore, the LMS is not a mere substitute for books but also a meaningful and necessary addition for the expansion of world knowledge
Lessons Learnt & Recommendations	The use of sign language furthers the reading competence of deaf people and enhances their acceptance and understanding of learning content presented to them. But most of the German deaf adults did not get school education in sign language and therefore lack basic reading and mathematical skills needed for further vocational training. The low reading skills also restricted their possibilities of information gathering and self directed learning. Based on these findings, a learning management system was adapted to the needs of deaf people with sign language videos for each text block as the most

	important feature. Providing sign language videos helped the users improve their reading skills and enabled them to learn more independently. Adapting a learning management system was given the preference in comparison to proprietary solutions, because using a learning management system facilitated content creation and content adaption and the learners got a wide range of standardized user interaction possibilities.
Country	Germany
Name of the Institution/Education Center	Fraunhofer Institute for Applied Information Technology and Aachen University

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