VIRTUAL SIGN ANIMATED PEDAGOGICAL AGENT TO SUPPORT COMPUTER EDUCATION FOR DEAF LEARNERS

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ABSTRACT

A Virtual Sign Animated Pedagogic Agent (VSAPA) is a software tool designed to support a computer-based learning environment for Deaf and Hard of Hearing (D/HH) students. The topic "webcam communication" was used as a demonstrative case study. The usability of the VSAPA learning environment was evaluated on D/HH students in comparison with those of static VSAPA picture and video interface. The results revealed that the VSAPA learning environment facilitated task performance in terms of ability and time to complete the tasks. The results showed significant interface effect on user task performance between the VSAPA and static picture in time spent for doing exercises, but not in time spent for going through the content at their own pace. However, the percentage of participants completing the exercises without error (effectiveness) was slightly higher in the VSAPA group. D/HH students’ performance in doing exercise is significantly higher in the VSAPA group when compared to the static. Upon comparing the effect of interface between VSAPA and video, the mean task time was higher in the video group both in studying the context and doing exercises. However, the ability to do exercise of D/HH students in both groups seemed to be similar. Rating of participants’ satisfaction by using the system usability scale showed the highest rate in VSAPA interface, followed by video and static picture. To explore the use of the VSAPA learning environment, a multimedia course on Information and Computer Technology (ICT) was implemented to forty D/HH students that were randomly divided into three experimental groups and one control group. The first group received ICT learning via the VSAPA learning environment. The second group was exposed to the same ICT content via a Hearing Teacher via Sign Language Interpreter (HTSLI). The third group studied by themselves using Text-Assisted (TA) instruction. The control group received none of the above interventions. The results showed that students exposed to the VSAPA learning environment had higher percentage gain in the post-test when compared to those in the HTSLI and TA groups. The D/HH students also had high positive attitudes toward the VSAPA learning environment. This study suggests that incorporating a Virtual Sign Animated Pedagogical Agent into a multimedia learning environment can enhance D/HH students’ learning.

KEY WORDS: SIGN ANIMATED PEDAGOGIC AGENT/ DEAF AND HARD OF HEARING / COMPUTER-BASED LEARNING / USABILITY TEST

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