Evaluation of a virtual reality-based ergonomics tutorial

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Abstract

The interest in distributing education via the World Wide Web in the form of web-based training (WBT) has increased greatly during recent years. Shortcomings of traditional hypertext WBTs have let to the proposal to merge them with virtual reality (VR) scenarios. To test the validity of this proposal, the usability of such a VR-enhanced WBT on the ergonomic design of computer workstations was investigated from two perspectives: the utilisation of the content, in terms of page views and view times, and task performance, using sensitivity and bias indices of signal detection theory, and comparing them to data recorded in an equivalent physical laboratory setting. Results for sensitivity indicate that VR scenarios are suitable to represent the general spatial layout, but less suitable to represent object details, due to current technical limitations. Results for response bias, page views, and time data provide evidence for a cursory information processing, suggesting a high segmentation of the content.

Introduction

Recently much effort has been dedicated to developing e-learning applications for the World Wide Web (WWW). The potential benefits of such web-based trainings (WBTs) are manifold, like the use of standard software, rapid and frequent updating of the courseware, and the option to choose location, time, and speed of the study (Daniel, 1998). Despite widespread enthusiasm, the currently available results on the utilisation of WBTs are rather disillusioning, as illustrated by findings of a joint study of the American Society of Training and Development and the MASIE Center (ASTD & MASIE Center, 2001). They determined start rates of such courses at 16 companies in the U.S., the percentage of employees who actually started of those who were offered a course, which was 32% for voluntary programmes, on the average. Completion rates –specified in terms of the percentage of employees who actually finished of those who started a course– are not reported quantitatively but rather described as ‘notoriously low’. Some authors (e.g., Wegerif, 1998) attribute low start and completion rates to the lack of social interaction and teamwork opportunities. Others (e.g., Nielsen, 1999) doubt that the social dimension is the main problem but rather focus on the usability of the corresponding applications. A common strategy in developing WBTs is