

Replicating Human Interaction to Support E-Learning

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INTRODUCTION

HCI-related subjects need to be considered to make e-learning more effective; examples of such subjects are: psychology, sociology, cognitive science, ergonomics, computer science, software engineering, users, design, usability evaluation, learning styles, teaching styles, communication preference, personality types, and neuro-linguistic programming language patterns. This article discusses the way some components of HI can be introduced to increase the effectiveness of e-learning by using an intuitive interactive e-learning tool that incorporates communication preference (CP), specific learning styles (LS), neurolinguistic programming (NLP) language patterns, and subliminal text messaging. The article starts by looking at the current state of distance learning tools (DLTs), intelligent tutoring systems (ITS) and “the way we learn”. It then discusses HI and shows how this was implemented to enhance the learning experience.

BACKGROUND

In this section, we briefly review the current states in DLT and ITS.

The general accepted standard, with current DLTs, is that the learner must be able to experience self-directed learning, asynchronous and synchronous communication (Janvier & Ghaoui, 2002a, 2003a).

Bouras and Philopulos (2000) in their article consider that “distributed virtual learning environment,” using a combination of HTML, Java, and the VRML (Virtual Reality Modelling Language), makes acquiring knowledge easier by providing such facili-

ties as virtual chat rooms for student-student-teacher interaction, lectures using the virtual environment, announcement boards, slide presentations, and links to Web pages.

People’s experience (including ours) of a number of DLTs was that, while they achieved an objective of containing and presenting knowledge extremely well, the experience of using them fell far short of normal HI, was flat, and gave no rewarding motivation. The user had to accept a standard presentation that did not vary from user to user; briefly there was no real system that approached HI, and, thus, the learning experience lacked the quality that was required to make it as effective as it should be.

Similarly with ITS, they are normally built for a specific purpose with student modelling being developed from the interaction between the student and the system.

Murray (1997) postulates that while ITS, also called knowledge-based tutors, are becoming more common and proving to be increasingly effective, each one must still be built from scratch at a significant cost. Domain independent tools for authoring all aspects of ITS (the domain model, the teaching strategies, the learner model, and the learning environment) have been developed. They go beyond traditional computer-based instruction in trying to build models of subject matter expertise, instructional expertise, and/or diagnostic expertise. They can be powerful and effective learning environments; however, they are very expensive in time and cost, and difficult to build.

Nkambou and Kabanza (2001) report that most recent ITS architectures have focused on the tutor or curriculum components but with little attention being paid to planning and intelligent collaboration between the different components. They suggest

that the ideal architecture contains a curriculum model, a tutor (pedagogical) model, and a learner model: This last is central to an ITS.

To move forward, e-learning requires a combination of both; however, Murray (1999), in common with many other researchers, believes that ITS are too complex for the untrained user and that:

we should expect users to have a reasonable degree of training in how to use them, on the order of database programming, CAD-CAM authoring, 3-D modelling, or spreadsheet macro scripting.

In e-learning, the development has taken two routes: that of the DLT and that of the ITS. With both, there is no effort to pre-determine the student's psyche before the system is used, and thus the basic problem of HI replication in HCI has not been instigated at the inception of an e-learning session.

MAIN ISSUES IN HUMAN INTERACTION

In this section, we discuss communication preference, personality types, neurolinguistic programming, NLP language patterns, and subliminal text messaging.

Communication Preference (CP)

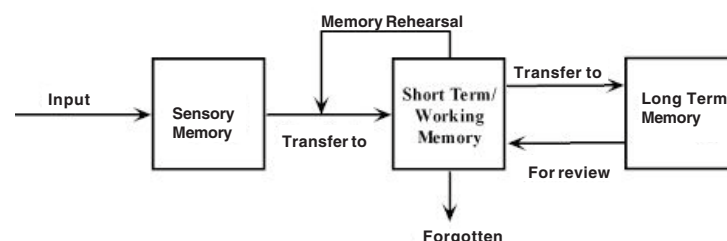
Each person has a preference in the way he or she communicates with others; they also have preferences in the way to learn or pass on information to someone else: This is called communication preference. Learning is introduced by one of the five

senses (touch, sight, taste, hearing, and smell) and initially passes into the subconscious sensual memory from their sensual memory to short-term memory and then, usually via rehearsal to long-term memory. All input into short-term memory is filtered, interpreted, and assessed against previously input, beliefs, and concepts using perceptual constancy, perceptual organization, perceptual selectivity, and perceptual readiness. Cue recognition allows for memory to pick out the key points that link to further memory recall and practice a skill using cognitive, psychomotor and perceptual skills (Cotton, 1995).

Stored instances (single items of memory) do not necessarily represent actuality due to the fact that they have already been distorted by the subject's own interpretation of the facts as perceived by their "inner voice, eye, ear, nose, and taste." Initially, instances are stored in short-term memory where the first and last inputs of a stream of instances are easier to recall: These can then be transferred to long-term memory by rehearsal. Different individuals use their preferred inner sense to aid perception. For learning to be effective, new instances are associated with existing instances. The use of the working memory constantly improves and refines long-term memory; indeed, practical "day-dreaming" is a form of forward planning that can improve retention (Cotton, 1995).

Iconic sensory input is the most important for remembering and learning. Cotton (1995) showed that using an A4 sheet divided into sections with questions and answers aided storing—linking this with sound, further increased retention in long-term memory. Research shows a link between good recall and good recognition, and that memory is seldom completely lost: It only requires specific cues to connect linked instances and bring them to the

Figure 1. Memory transfers



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