Chapter XV

Cognitive Styles, Metacognition and the Design of E-Learning Environments

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ABSTRACT
This chapter considers the use of cognitive styles and metacognitive skills in the design and development of e-learning environments. Participants involved in a unit in Human Computer Interaction used the results of a Riding’s Cognitive Styles Analysis to assist in the design and development of Web-based Individual Learning Environments (ILEs). Student reflections and cognitive styles results are considered in terms of their impact on the design process. They are also used to consider participants’ metacognitive awareness of their own cognitive and learning styles. It is suggested that the use of cognitive styles in this manner will produce interfaces and environments more suited to the learning requirements of each individual. In addition, the process of reflecting on and using the style results will help develop more metacognitively aware learners. The individual environment and metacognitive awareness are both desirable
elements for a student-centered learning system for successfully participating in virtual education.

INTRODUCTION

This chapter considers the use of cognitive styles and metacognitive skills in the design and development of e-learning environments. The cognitive styles of individual students were used to help construct individual learning environments for Web-based learning. To facilitate this, a computer-based cognitive styles test was administered to a group of 64 Human Computer Interaction students. As an assessed part of the unit, students were then asked to document the process of designing and developing a Web-based Individual Learning Environment (ILE) with specific reference to their own cognitive style. Coyne has suggested that when using technology for design, “we discover new ways of acting and thinking” and that we “reveal aspects of our practice” (Coyne, 1995), and it was considered that the ILE design exercise would be particularly suitable for students considering their own cognitive styles.

For the purposes of this study, the cognitive style measure used was Riding’s Cognitive Styles Analysis (Riding, 1991, 1998). Riding’s cognitive style construct has two major dimensions which affect how each individual holds and processes information and thus impact on learning style and personality. The dimensions of the cognitive style construct were used by the participants for reflection and to inform the design of Web-based learning environments for interfacing with learning resources. An additional consideration was that student awareness of the learning process has become increasingly relevant with the shift of emphasis towards active learning and the increased use of learning technologies. This implies a need for students to become more actively involved in the management of their own learning and an associated need for each student to be more metacognitively aware of his or her personal resources. It is suggested that each student can use knowledge of his or her cognitive styles in ways that could help the individual develop his or her learning skills and strategies in the light of useful self-knowledge.

BACKGROUND

A gap has emerged between the model of student learning in higher education being proposed (active, resource-based, student-driven learning) and the experience of many students and lecturers. A continuing problem with the current scenario in higher education is that while there may have been a much expanded student intake and a move to a mass system, many of the processes and practices in use are those
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