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Implementation of learning style theory in an adaptive educational hypermedia (AEH) system

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Abstract

Adaptive educational hypermedia (AEH - a branch of web-based learning) systems seek to personalise the learning experience for their users. User modelling can be performed using various criteria, such as prior ability or domain-specific knowledge, in systems such as WHURLE [1], AHA! [2] and MOT [3]. These user preferences, forming a user profile, are usually stored in a database, and integrated with the AEH learning environment. The learner is then presented with material that is best suited to them, with adaptation occurring at either the content or link level, or both.

WHURLE (Web-based Hierarchical Universal Reactive Learning Environment) is an AEH system that has been used with many types of students, from secondary schools to those in Higher Education. It is a hypermedia-rich educational tool, suitable for all subjects, that seeks to address the pedagogical limitations of existing commercial Virtual Learning Environments. Its current user model is broadly based upon domain-specific knowledge. Investigations are under way to implement a user model based on learning style theory. This may be integrated with the early user model, or developed simply as a stand-alone module. Uniquely, WHURLE can change the user model used, as it is not a 'hard-wired' part of the system, but rather a component that can easily be interchanged.

Learning style theory advocates that since individuals are all different, they should learn in different ways; this suggests a natural integration with the principles of adaptive educational tools. There are many different learning styles in use around the world, such as the Dunn and Dunn model, Gardner's Multiple Intelligences, Kolb's theory of experiential learning and Riding and Rayner's Cognitive Styles Analysis. We will be discussing how we have implemented the Felder-Silverman Inventory of Learning Styles [4] into the WHURLE architecture in an attempt to enhance the learning experience for users.

[1] <http://whurle.sf.net>

[2] <http://aha.win.tue.nl/>

[3] <http://www.wis.win.tue.nl/~acristea/HTML/USI/MOT/>

[4] <http://www.ncsu.edu/felder-public/ILSpage.html>