Course delivery through the web: Effects of linear/nonlinear navigation and individual differences in online learning.

This research describes a study that examined the influences of cognitive style (as assessed by the CSA- Riding 1991) and Learners' Prior Knowledge on student recall performance of the contents of online course presented via two navigational formats (linear sequential navigation version versus nonlinear free navigation version). The study was investigated with a group of Egyptian students in the School of Specific Education, Ain Shams University, and Fayoum University (n= 300: 161 females and 139 males); their ages ranged from 19-22 years. The subjects were randomly assigned to either a linear version of the course or a nonlinear version. The linear presentation allowed participants to see one topic/level at a time, in a predetermined order, but allowing backtracking and learner control of time. The nonlinear presentation version of the contents allowed subjects to choose any topic at each level similar to hierarchical menu and also allowed browsing and full access to all material and links. The participants' scores on the recall test, scores on the prior knowledge questionnaire and participant's ratios on both cognitive style dimensions were analyzed by means of analysis of variance.

Overall, the results of the study revealed the following significant differences in recall: (1) There was an interaction effect of navigation type, with the nonlinear version of navigation being better; (2) Prior knowledge was found to have a critical effect, with high prior knowledge learners doing better; (3) There was an interaction of cognitive style by navigation type, with wholist learners being better on the linear navigation version while the analytics doing better on the nonlinear version; (4) the study indicated that there was an interaction of prior knowledge by navigation type, with high prior knowledge learners doing better overall, and the difference is clear on the linear version of navigation; (5) The study also found a three way interaction of cognitive style by navigation type by prior knowledge; with the analytics' scores being steady on both versions of navigation regardless of prior knowledge, but the effect of prior knowledge was clear with the wholist learners on the linear navigation version, with wholist with high prior