Design of Adaptive Web Interfaces with Respect to Student Cognitive Styles

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Abstract

One of the obstacles for incorporating student cognitive styles into web-based learning systems is the adaptive representation of learning material in web-based environments. This study designed adaptive web interfaces with respect to students' cognitive styles by investigating the relationships between students' cognitive styles and browsing patterns of content and interactive components. The system then adaptively recommended learning content presented with a variety of students' preferred content and interactive components based on the students' cognitive styles. The cognitive style instrument applied in this study was the Myers-Briggs Type Indicator which is based on Jung's theory of cognitive styles. It is based on two fundamental cognitive functions, perception and judgment whose combinations form four cognitive styles, Interpersonal, Mastery, Understanding, and Self-expressive. An experiment was conducted to examine the impact of the proposed adaptive web-based system on students' engagement in learning. Two classes of college freshmen participated in the experiment. One class was assigned as the control group using the conventional web-bases system without adaptive web interfaces. The other class was assigned as the experimental group using the designed adaptive web interfaces. The experimental results revealed Interpersonal and Mastery students in the control group lost their patience more quickly than students of the other styles. Furthermore, the results showed the proposed adaptive learning system could effectively enhance students' engagement in learning for Interpersonal and Mastery students especially. The results provided evidence of the effectiveness of the adaptive web-based learning system focusing on student cognitive styles.

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