AN INVESTIGATION INTO THE EFFECTS OF DATABASE USE ON THE ORGANISATION OF STUDENT KNOWLEDGE.

by

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ABSTRACT

A knowledge based view of expertise points to the importance of well structured domain specific knowledge in developing expertise in a particular field. This study reports on the way in which a computer based data management system appears to influence student organisation of declarative knowledge of a domain towards more expert-like cognitive structures.

A class of Intermediate School students was divided into two groups. Groups had equal access to computers in terms of time, but one group used a word processor during the class program while students in the other group used a database to assist them in their classwork. For both groups, classroom practice stressed the importance of working in an environment that emphasised use of metacognitive strategies. It was hypothesised that the database group would show significant improvement in terms of the number of chunks, and the depth, of cognitive structure inferred, relative to the word processing group, as a result of their increased ability to discover relationships and trends in the data through datafile manipulation.

Cognitive structures were inferred using two techniques. The main technique (Ordered Tree Technique) inferred cognitive structures from each student's ordering of a set of concepts relating to the class unit of work. Analysis of pre- and post-unit structures inferred from this technique indicates that the database group did in fact develop significantly more expert-like cognitive structures than the word processing group. A second technique (Concept Structuring Analysis Technique), used only post-unit, provides converging evidence that supports this finding.

Results are discussed in terms of the type of restructuring that has occurred, the context in which the results arose, and the validity of depth and chunking as variables relevant to education. It is suggested that further research could focus on explicit knowledge representation by students as a way of helping those students develop their expertise in particular knowledge domains.

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