

Collaborative learning from an analogy

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Introduction

Analogy is an important mechanism of learning: by implicitly or explicitly comparing examples, people are able to abstract common structural features (cf. Gentner, 1989) or generalize over them (Ross & Kennedy, 1990). Our study investigated how analogical learning occurs in a group using complex material. We identify a correlation of roles with specific analogical learning processes, and related to that a repeated cycle of analogical learning with apparently varying learning outcomes.

The study

Procedure

A group of three students was presented with two software engineering cases in sequence. Their task was to transfer a particular software architecture (pattern) from the first to the second problem, requiring them to abstract a specific configuration of programming techniques (for details, see Tscholl & Dowell, 2003). The students worked on a network-based system that featured communication (chat and shared whiteboard) and display facilities.

Analysis

The episode analysis determined foci of topic in the discourse. Topic changes were identified using the DISCOUNT scheme (Pilkington, 1999). The process analysis distinguished three types of dialogue contribution in accordance with the general processes of analogies (cf. Gick & Holyoak, 1983): schema abstraction from the first example (SA); similarity statements (distinguished into semantic (SE) and syntactic similarity (SY)); and solution transfers (distinguished between transfers that show understanding (T) and 'blind copying', a transfer based on syntactic similarities of the problems (BC)).

Results

Phases: the analysis of topic foci individuated 5 phases. The first three are characterized by a high frequency of schema abstraction of the first program and understanding-based transfer. In the last two stages schema abstraction is largely missing and blind copying is frequent (table 1).

Roles: student B is leading the group in explaining the first program. Students D and A make a significant use of B's explanations to construct the second program (table 2) and then contribute to the solution by blindly copying implementations. Student B is also most proficient in seeing the semantic similarities between the two cases.

Discussion

The study shows that individual contributions can be differentially associated with the component processes of analogical reasoning in a group. A schema abstracted by one individual was subsequently exploited by the others. Further, a variability in learning outcomes over the different phases of the exercise is evident: learning from an analogy will be more proficient when, as in the early phases, transfer makes use of an abstracted schema.

Table 1: Variation of processes by phase

	SA	SE	SY	T	BC
1 st	5	1		4	
2 nd	7	2		7	
3 rd	3	1		2	4
4 th			3		6
5 th			2		6

Table 2: Variation in processes by student

	SA	SE	SY	T	BC
B	11	4		2	4
D	1	2	2	6	7
A	3		3	5	5

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