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Adapting and Applying CI Theory to Model Real World Design: A Case of Storyboard Review

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Keywords

Pictorial comprehension; design problem-solving; drawing; real-world setting

Introduction

Kintsch's (1998) CI (comprehension-integration) theory and model has proven valuable for describing many comprehension tasks, including goal-directed problem solving such as mathematical word problems (Nathan, Kintsch, & Young, 1992). This paper reports on adapting Kintsch's model for understanding cognitive processes involved in pictorial problem solving tasks in a real-world setting.

Theoretical Background

The present research draws on the following CI assumptions: different forms of representations support different types of computational processes; components and characteristics of the CI model and processes; situated nature of comprehension including prior knowledge and contextual goals. Additionally, the present research builds on a prior CI adaptation used in researching film comprehension (Blatter, 2000)

Empirical Context

The context for this research was storyboarding in an animation studio. A storyboard is a pictorial representation of the sequence of scenes. A storyboard is critical for development, and its review is frequently collaborative.

Method

A four-year case study (Blatter, 2005) included video taped field observations (supplemented by individual think-aloud protocols) of seven artists through four animations. Grounded theory methods were used to broadly code 27 hours of taped collaborations. A microanalysis of 1308 utterances in a 90-minute review– speech, gesture, and drawing- were coded to identify goals in normative and problem 'board review.

Findings

Twelve semantic elements structured in three goal spaces contributed to the situation of storyboard review: filmic (as viewed on a screen), fictive (as a character-motivated narrative), directive activity (as an organizational and cognitive tool). The findings differentiated normative from problem finding comprehension. In both cases, the "text" was the same – i.e., the panel and elements drawn in the style of the future film. However, while the situational goal space of a normative review defaulted to the fictive, problem finding changed the structure of the comprehension task. In particular, the units were decomposed, the situation was guided by filmic as well as directive concerns, and appropriate problem models required construction. Significantly, the artists represented their situation and problem models externally, using specific drawing systems (Willats, 1997) to support inferences about space and time.

Discussion

Constructing situation models of the goal spaces required adopting unique frames of reference, supporting different types of reasoning (Levelt, 1999). Externalizing situation models using unique drawing systems provided graphical abstractions of cinematic and practical knowledge, and cuing and grounding a shared construction of problem models.

Conclusion

This research extended the CI model to real world, complex, pictorial display-based comprehension.

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