

Title: Application of contexts in the design and use of intelligent tutoring systems

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Abstract:

The success of an Intelligent Tutoring System (ITS) depends on adequate consideration of the various contexts encompassing its design and implementation. While there is an increasing recognition of context in the 'Intelligent' aspect of an ITS, there is a need for recognition that context affects the 'Tutoring' and 'System' aspects as well. This paper proposes three classes of contexts surrounding the design and use of an ITS: Interactional, Environmental and Objectival contexts. Interactional contexts are used by the system while the Environmental contexts affect the design and use of an ITS. Objectival contexts refer to the objectives of a typical intelligent tutoring system as exhibited from its 'teaching' and 'assessment' perspectives and their relative importance within the systems.

The Interactional contexts are the contexts within which the interaction between an ITS and a student takes place. These contexts, where implemented, are likely to be integral to knowledge representation, reasoning, discourse management and other system architectural aspects of a system.

The Environmental contexts include the social and technological conditions shaping the value system and common metaphors; the nature of subject discipline; suitability of an ITS according to the characteristics of knowledge; and the role of a human teacher within a joint cognitive system consisting of the ITS.

The Objectival contexts refer to the apparently anomalous situation in an educational system, where the teaching aims to construct 'perfect'

knowledge of the discipline while the assessment accepts that the constructed discipline knowledge is, in the main, 'imperfect'.

It is observed that existing implementations of context in ITSs differ from each other significantly in terms of their understanding of context and corresponding functionality provided in the system. Literature does not indicate any efforts on the issue of Environmental or Objectival contexts and appears to be concerned only with the Interactional contexts. This paper proposes a much broader classification of context to enable a better understanding of powerful contexts surrounding a student-ITS interaction and to help in developing more purposeful, usable and successful ITSs.