

The Knowledge Medium: Designing Effective Computer Based Learning Environments (Book Review)

Reviewer:

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The Knowledge Medium: Designing Effective Computer Based Learning Environments
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How effective computer-based learning environments should be designed? This book introduces a number of theories from a wide range of disciplines such as psychology, learning/educational theory, film, and computer science to explore answers to the question. Another key point of this book is to view computer software used for education as a new medium of knowledge to re-envision educational technology. In particular, the author compares computer with film, which can be viewed as the most similar media, to attempt applying the film theory to designing the educational software. In other words, the film theory is regarded as the lens for examining techniques/technologies that the educational software has to possess. The book also reviews original case studies from both the administrative and student perspectives on distance learning pedagogical practices in higher education, whose results justify the theoretical discussion in this book.

The book comprises two parts.

Part I: Computer-Based Learning Theory and Practice

In Part I, the history of educational technology and related learning theory is briefly sketched out. Introducing various viewpoints such as behaviorism/constructivism, learning styles/multiple intelligence/self-directedness, and child/adult, the author explains learning theory for educational software design, and raises design issues to be addressed.

The author also examines tutorial and group methods for distance learning with the case studies. As for the tutorial method, the case studies showed the necessity of customized tutorial and computerized assistant. The result brings about important issues related to customization and adaptation such as an issue of how to customize tutorial to learning styles. As for the group method, the case studies showed that learning with other students is not always preferred. It depends on student's characteristics such as independency. The author accordingly addresses the issues of learning community formation, virtual team, task organization, and so on.

In this part, the literature on Human-Computer Interaction (HCI) is also examined. The author discusses several aspects and issues of HCI relevant to education: human factors, usability, interface design, GOMS models, command language/direct manipulation, hypertext, graphics/visuals, metaphor, animation, organization, and task analysis. These aspects are related to the design of computer-based learning environments. The author then describes the issues of interactivity and navigation, which all computer-based learning environments must address. In the interaction with media, in particular, the case studies showed that students tended to like maximum control over how to navigate through the courseware. Most administrators agreed that it was necessary to understand how students navigated in a self-controlled way. These results bring about navigation issues that have been addressed by current educational hypertext/hypermedia systems. The self-controlled

navigation involves knowledge-structuring and knowledge organization. The computer tools such as concept maps, and reorganization tools for cognitive amplification are accordingly introduced.

This part ends with faculty and teaching issues that came up in the case studies. These issues are of central concern when considering the pedagogy of computer-based learning environments. Comparing with traditional face-to-face course, the author makes clear the effectiveness and issues of computer-based course.

Part II: Computer as Medium

The second part of *The Knowledge Medium* investigates the computer-based learning environment as a medium by looking at media theory and relevant film criticism including documentary and fiction film theory. The film theory explores meaning construction within a viewer. The author expects that it provides a foundation for better understanding of computer-based learning environments and their users. Film-related issues such as phenomenology and ideology are discussed, as well as the history of moving and still photography, documentary film and recent film theory such as cognitive film theory.

The author also examines dramatic structure of film in terms of specific issues such as genre, conventions and editing. The dramatic structure, which consists of character, action, and ending (goal), can correspond to agent, interaction, and learning in the computer-based learning environments. The editing, which is a process of assembling different shots together in some sort of meaning-giving order, is also introduced.

In this book, the author claims that *point of view* and *subjectivity* play an important role in understanding psychological states and reactions to media. The issues related to these are accordingly discussed. In addition, the recent narrative psychology movement on computer environments is examined, particularly as they related to the use of stories, simulations, and cases. The effectiveness of these narratives in the contexts of learning is discussed.

Finally..

Finally, *The Knowledge Medium* is a book for those who are interested in designing computer-based learning environments, in which higher learning effects could be produced. Although it is not a How-to book, it provides the readers with theoretical foundations for the design. In particular, the discussion about comparison between educational software and film is quite informative even for those who are unfamiliar with the film theory. After reading *The Knowledge Medium*, the readers could discover novel ideas about the computer-based learning environments.