Designing Distributed Learning Environments with Intelligent Software Agents

(Book Review)

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Textbook Details:

Designing Distributed Learning Environments with Intelligent Software Agents
Fuhua Oscar Lin (Ed.)
2005, Information Science Publishing (an imprint of Idea Group Inc.)
ISBN 1-59140-500-9 (hardcover), 1-59140-501-7 (paperback)
311 pages.

I believe that education is an investment for the future of society. To develop our society we need to achieve the best education for every individual through providing every appropriate means for the particular individual. To provide the best education for each individual, we must perforce adapt our education to the individual. One adaption is to free the individual constraints of place and time. Many publications and books are appearing on the topic of customising distributed education for the individuals. (These individuals I prefer to call "educatees" -- I hate the inadequate term "learners", which implies only children and craftspeople.) The idea is to design a learning environment that will enable the individual educatees to acquire knowledge just in time, anytime, anywhere, and tailored to their personal needs.

As a reader of this publication, you are probably involved some way in the designing of a distributed environment for local or distance education, teaching, tutoring or instruction. If so, you should obtain this book. The book is a useful compilation of ten chapters, written by twenty-three scholars from around the world.

Do not be put off by the word "agents" in the title. "Agents" are computer services that humans (or even other agents) can call upon to accomplish their task (p. 4). The common viewpoint that the authors adopt is that agents are required to help in the design of distributed computer systems to be used for education. The approach the authors take is complementary to the common approach of designing with learning objects.

This is not a book that will get your learning environment going. However it does reveal many of the issues that you have to face in creating a new learning environment.

The book reports on the most recent advances in agent technologies for distributed learning. Chapters are devoted to various aspects of intelligent software agents in distributed learning, including the methodological and technical issues on where and how intelligent agents can contribute to meeting the needs of distributed learning. This book benefits the Artificial Intelligence society and educational communities in their research and development. It offers new and interesting research issues surrounding the development of distributed learning environments. In addition, ideas presented in the book are applicable to other domains such as Agent-Supported Web Services, distributed business process and resource integration, Computer-Supported Collaborative Work and e-Commerce. (Book description from Amazon.com)

For me, the main contribution in the book is provided by Mohamed Ally in his chapter VI titled "Intelligent Tutoring Systems for Distributed Learning". Ally sensibly comes to grips with the basics of designing for the differing needs and styles of educatees. Educational research has traditionally focused on studying the instruction of groups of educatees rather than individual education. So, little is known about the individual learning characteristics which are vital to help us develop the student model and pedagogical modules for intelligent tutoring systems.

"When students come to the learning process, they come with many individual differences, such as unique learning styles, different motivational levels, different backgrounds, different levels of expertise, and different expectations. The question is how to develop an intelligent tutoring system that identifies these individual differences and adapts the instruction to meet learners' individual needs. A well-designed intelligent tutoring system will be able to cater to learners' individual needs in a distributed environment." (p. 168)

My thoughts on the topic are that if, for example, material being delivered to a cell-phone or hand-held computer would have all gratuitous graphics stripped out. Topics that the educatee has demonstrated mastery of need not (and should not) be delivered. Topics that the particular educatees do not need in their current career can be safely omitted or postponed until they are relevant. On the other hand, topics that require practice can be repeated with slightly different variations until the educatee has had enough practice. The vocabulary of the material can be switched to match that of the career path of the educatees. Questions from the educatees that are unanswerable from the contained knowledge base should be flagged for subsequent treatment outside the course and possible inclusion in later versions of the course. If the current activity level of the educatee is measured, it might serve as a proxy for sensing the educatees' sleepiness and cause the system to bring in some anecdote, humour or specific examples from the domain of the individual educatees to sustain their interest. By building in assessment into every topic, (e.g. fill-the-blanks-in assessment) feedback of problems such as commonly made errors can be provided to the educator, so that further refinement of the course can take place.

The relevance of the book is that it comes at a time when researchers around the world are still struggling to come to grips with the questions that need to be solved, and a reading of the book suggests more directions for research than there will be available scholars. An index is provided to help in this regard.

The researcher in this area will surely also be interested in the recent paper by Pantano Rokou, F., Rokou, E., & Rokos, Y. (2004). entitled "Modeling Web-based Educational Systems: process Design Teaching Model" in *Educational Technology & Society,* 7 (1), 42-50. This paper describes the introduction of stereotypes to the pedagogical design of intelligent tutoring systems and appropriate modifications of the existing package diagrams of the Unified Modeling Language.

In conclusion, put the book on your reading list.