

# Education and Artificial Intelligence or Foundations of Modern Didactics of University Education (in Russian)

(Book Review)

## **Reviewer:**

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## **Textbook Details:**

Education and Artificial Intelligence or Foundations of Modern Didactics of University Education  
(in Russian)

G. A. Atanov and I. N. Pustinnikova

2002, DOU, Donetsk, Ukraine

ISBN 966-8117-00-X

The book "Education and Artificial Intelligence or Foundations of Modern Didactics of University Education" is devoted to the overall theory of education and, to a lesser degree, to the use of artificial intelligence in education. The author is writing largely from the perspective of the Soviet/Russian school. Reflecting this fact, the overwhelming majority of 200+ references given at the end of the book are to Soviet, Russian and Ukrainian sources.

Chapter 1 is devoted to the description of an action-based approach to education. It includes the consideration of the aims of education, educational ideology and methodology, models of activity in general and education-related activity in particular, educational tasks and ways to their fulfilment. The author considers approaches for establishing structure in educational activities, and puts particular emphasis on functional structure. The chapter concludes by outlining approaches to learner modelling and to controlling learning activity.

Chapter 2 is devoted to knowledge engineering. The authors consider vertical and horizontal structure of knowledge, and discuss the approaches to knowledge representation, including logical, production, semantic nets, and frame methods.

Chapter 3 is devoted to subject learner modelling, including thematic subject learner modelling, functional subject learner modelling, procedural subject learner modelling, operational subject learner modelling, and semantic subject learner modelling.

Chapter 4 concentrates on current student modelling. Vertical and horizontal structure approaches to current student modelling are considered. Various types of tests are described in detail. The chapter concludes by considering the ways to determine if university education targets are met.

Chapter 5 is devoted to problem-based education. Problem-based education is viewed from the perspective of an error model. The history of problem-based education is considered. Contradictions in education are analysed from the point of view of dialectics. The chapter is concluded by suggesting a structured approach to developing problem situations.

Chapter 6 considers notions in subject domains and their structuring. Associative nets are suggested as an approach to establishing hierarchies of notions. Production methods are used to establish relationships between notions. Finally, the structuring of notions as an activity is presented as a type of learning.

Chapter 7 considers the role of expert systems and their classification. Bayesian networks and diagnostic expert systems are covered in detail. Examples of using expert systems are given, and their use in teacher education is considered.

Finally, Chapter 8 considers realizations of the action-based approach to education in Computer Based Training applications. A system devoted to teaching physics is described in detail, which is used to provide an in-depth coverage of the frames method.

Overall, the book serves as an introduction to educational theory and its implications for computer-based teaching, presented from a perspective that somewhat differs from mainstream. It may be valuable as a source of fresh thinking and new ideas. On the other hand, it does not constitute a comprehensive up-to-date coverage, as certain important topics, such as constructivist education or the use of Internet in Computer Based Training, are not covered.