Smart Machines in Education
(Book Review)

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Smart Machines in Education
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The main theme of the book, Smart Machines in Education, is woven in the utilisation of the research results from cognitive science and artificial intelligence to advance our perception of technology for education into the next revolution. The main focus is placed on the illustrations of educational systems, and the intention is to promote the “intelligent” ideas in virtual learning environments.

Chapters that focus on utilizing AI technologies in educational systems includes: Mostow and Aist’s LISTEN which is a tutor that teaches students to read correctly using speech-recognition technology; Fobus’ notion of articulate software which is a system that possesses explicit knowledge about the domain in order to help students understand the domain; Lester and his colleagues’ animated pedagogical agent, which presented life-like animated figures interacting with students in order to provide meaningful, timely, and motivational feedback to the students; and De Koning and Bredeweg’s model-based educational system that is capable of performing automatically both subject matter modelling and student behaviour diagnosis.

A number of interesting and practical ideas emerged from the sections of the book. Schank and Neaman’s goal-based scenarios, which is a learning-by-doing approach, not only creates story-like, motivating, authentic, and informative scenarios for students to work on, but also provides deliberate traps that fail the students in terms of their expectations (expectation failure). Learning from costless failure is one of the important advantages in educational simulation. Expectation failures synthesize situations that students could encounter in their real-life, and encourage them to maturate their scientific investigation skills in order to learn the lessons from the failures.

Another novel idea is the creation of a teachable agent (Biswas, Schwartz, & Bransford). One can often learn a lot from the feedback and responses from the taught during the teaching process. The teachable agents offer this opportunity to students while protecting them from being harmed by “in-experienced teachers” (other students) at the same time.

For those who are interested in intelligent tutoring systems (ITSs), the book provides the discussion of Woolf and her colleagues on the capabilities that an ITS could have, and Bellman’s reflections on the CAETI Program, which is a large-scale government-sponsored technology insertion program in USA. These two chapters offer a glance of the state-of-the-art products, practices and development references on intelligent tutors.

Smart Machines in Education is a book for those who are interested in educational technologies no matter novice or expert. The ideal educational setting in which the capable teachers and assistants are at every learner’s elbow whenever the learners are ready to learn and for however long that takes, is clearly delineated by the editors. The chapters in this book show an augury on how the dreamed-of ideas can be realised by the advances in computer-based technology, artificial intelligence, and cognitive theory. After reading Smart Machine in Education, I am deeply amazed by the enthusiasm of the developers in this field, interesting and inspiring ideas that are being discovered, robust and sophisticated systems that are being built, and most importantly the ideal and dreamed-of learning environment that can already be foreseen, and made possible by the endeavours of all researchers. Their works will be highly appreciated.