The Role of System Dynamics in Learning Environments

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Abstract

Due to increasing demand for simulation and modeling, efforts are needed to build up more powerful simulation and modeling methodologies that can help to facilitate learning complex dynamic systems. By learning we mean the acquisition of knowledge, skills and experience for better and faster learning of the various types of complex dynamic systems. System dynamics is one of the successful well formulated methodologies that provides a perfect framework for building highly interactive learning environments where learners involve in reasoning about the relationships between the structure and the dynamics of a complex system. In this paper, we address two recent well known approaches (Black-Box and Glass-Box) that enhance learning capabilities in a typical complex dynamic system and demonstrate the overall learning effectiveness by using their own methodologies. Furthermore, we present a critical comparison of traditional black-box approach and the innovative glass-box approach. In addition, we also present two experiments that are associated with the black-box approach. These experiments will be very helpful for understanding the inadequacy of a black-box approach when compare it to the glass-box approach.