

Self Organization in Complex Learning Environments

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Talk Abstract

This talk discusses learning in a complex “informational” environment. Modeling the *learning curve* has been an ongoing study of great historical interest. Thurstone's early work from 1919 lays the foundation for a quantification of the evolution of learning a specific set of tasks [1]. This research contributes to the vast body of knowledge in mathematical psychology by employing a novel dynamic network theoretic perspective. We build on the body of previous knowledge and discuss an experimentally supported mathematical model which is grounded in a complex systems based framework of meaning-making [2]. More specifically, using several years of data from a bachelor's level mathematics course, we propose a Gompertz model to represent an evolving semantic network which reveals the signatures of self-organized systems. This naturally leads to questions about organization and collective behavior in different complex systems – living and non-living; machines and organisms [3]. We will contrast the outcomes of this work with results from other studies on self-organizing systems which helps us see cognition and meaning-making as a complex ‘dissipative’ phenomenon capable of emergence, and one which can tell us something about the nature of ‘understanding’ and creativity.

Keywords: Mathematical Psychology, Complexity, Learning

Acknowledgements:

The author acknowledges help from several students and colleagues who were involved in various aspects of this work: Dr. James Dixon, John O'Meara and Vlad Nita.

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