



CoCo Seminar Series Fall 2018

Creativity as an Emergent Property of Complex Educational System

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The importance of creativity in education has been discussed often in the literature in recent times. While there remains no simple definition of creativity, the psychological literature points to traits which can be related to this idea. These include: the ability to think outside the box, make connections between seemingly disparate ideas, question norms etc. The literature provides several examples of classroom experiments to help foster creativity in the classroom which includes getting students to recognize mathematics and the sciences as being creative endeavors. While these attempts are noteworthy, they suffer from a fundamental, fatal flaw; they are rooted in an unstable underlying education system. In this talk, we propose that to promote creative thinking in our classrooms, we need to see our educational system as a complex system or a network of connections between different disciplines. The 20th century notion, that school and college education is rooted in discipline based reductionism and that learning amounts to specialization caters to a few, leaving a larger and larger body of students to fail out of the system. The American liberal arts educational model prides itself on giving students a holistic perspective by exposing them to various disciplines. However, merely exposing students to different ideas without having them realize the deep, underlying connections is like expecting interesting dynamics in a collection of disconnected nodes. We propose that education system is a complex system composed of various nodes, representing different disciplines, and the edges representing the flow of unifying ideas between them. Connections between the nodes allows for flow in these paths, resulting in greater opportunity for creativity, which is an emergent property of such a network. The abstract notions discussed above are illustrated by deliberate attempts (ambitious though small) made at the author's institution to build an educational experience focused on creativity.

Dr. Ashwin Vaidya is an Associate Professor in the Department of Mathematical Sciences and Physics & Astronomy at Montclair State University. His primary research interests lie in the areas of dynamical systems, fluid dynamics and pattern formation.

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