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Abstract

This paper is a thematic analysis of four books that emphasize the coalescence of complexity science, neuroscience, and generative leadership in education. The three concepts are defined and discussed in regard to the influence on practical challenges of educational leadership. Specifically, this paper advocates for the ideal benefits of understanding complexity science in society; as it may be directly applied to education to produce leaders who are open and aware to adapting to frequent change. Generative leadership extends upon this concept as it expresses the significance of complex social interactions amongst individuals of an organization in efforts to maintain creative and effective collaboration. This paper briefly discusses the role of neuroscience in social interactions; that is, highlighting the value of an integrative mind to an educational leader. This paper concludes with an implications section that advises empathy as a basis for educational leadership in today's complex society.

Keywords

Complexity Science, Generative Leadership, Neuroscience, Educational Leadership

Author Statement

Brice Scott is a passionate secondary and post-secondary educator who aims to contribute to improving the landscape of education for diverse learners.

Introduction

An individual who holds a position of leadership, notably in the field of education, most often intends to produce positive change to their respective settings in both tangible and intangible fashions. The journey to success in educational leadership will begin with a consistent and appropriate approach to the environment in which the individual serves. In some cases, educational leaders choose an inappropriate approach for the situation, or simply fail to execute a proven approach in an effective manner. Given the complexity and unpredictability of the social environments that exist today, it is important that leaders equip themselves with tools and up-to-date knowledge to ultimately be defined as a *success* in their respective positions. This paper refers to the ideals of complexity science and generative leadership and contends that an individual in a position of leadership should harness their inner capacities and employ strategies in their leadership practices in which collaborating individuals can do the same. These strategies will assist in intertwining the essentials of neuroscience; specifically, individuals participating in healthy neurological relationships can connect in an attempt to tap into creativity for progress and collaboration toward social change in their respective settings.

Complexity Science in Education

In *Complexity and the Nexus of Leadership: Leveraging Nonlinear Science to Create Ecologies of Innovation*, Goldstein, Hazy, and Lichtenstein (2010) introduce complexity science as a study of the *complex* nature of our society; specifically, the interactions in the system, through which something new emerges, such as norms in a work group or a groundswell of momentum for a new enterprise. In education and schooling, inevitable interactions occur among persons such as teachers, administrators, staff, families, and students. Moreover, the complexity of the educational system extends into policy and decision-making, societal trends, an evolving economy, and many other factors that are customarily unpredictable. Consequently, educational leaders may find it difficult to execute their duties; and may begin to conform to the *heroic* vision of leadership which can result in a lack of innovation which is an integral part to the development of an educational organization (Goldstein, Hazy, & Lichtenstein, 2010). Complexity science is a notion that supports the wide-ranging, daily challenges in education; specifically, Goldstein et al. (2010) assert that complexity science empowers individuals by demonstrating how they can alter a system, collectively making new things happen. Therefore, it can be inferred that educational leadership requires adaptability to complex settings in nature, as well as establishing relationships amongst

people built upon a foundation to embrace collaboration toward innovation.

Generative Leadership in Education

In *Generative Leadership: Shaping New Futures for Today's Schools*, Klimak, Ritzenhein, and Sullivan (2008) introduce a concept known as generative leadership which is an approach that requires recognizing the complexity of social interactions that surround schools and tapping into the collective intelligence, creativity, and energy of persons within the organization to generate productive growth and effective solutions. It is important to highlight the aspect of coalescence and the value of utilizing individual attributes to devise quality and whole decisions for an organization. The educational system existing within society is influenced from a multitude of angles and in various fashions; thus, a leader who chooses to act as the sole decision-maker in this complex process is neglecting potential significant and diverse contributions from others within the system. Klimak et al. (2008) assert that generative leaders see their schools as dynamic systems and every individual is an integral element of that system; and steadily emphasize the notion that the future is very shapeable but neither precisely predictable nor controllable. Therefore, complexity exists not only outside of an educational system; but the complexity within this system of

people shall also be embraced and acted upon to impact growth and improvement.

Neuroscience in Education

Generative leadership and collective efforts are greatly beneficial to the progress of any organizational system existing in the complex environment of today's society. However, the challenges of implementing and employing generative leadership raise interesting points that perhaps intensify the *complexity* of the leadership journey. Generative leaders recognize the importance of social interactions by persons within a system but the task of creating and maintaining productive social relationships may not be easily executed. In *Attachment-Based Teaching: Creating a Tribal Classroom*, Cozolino (2014) expresses the impact of neuroscience on persons in the education field; specifically, neuroscience supports the theory that our brains evolved to learn from caring and compassionate teachers who know us well and who are invested in our well-being. This theory aligns equally as well with goals of generative educational leaders; caring and compassion are traits that will assist in fostering meaningful and productive relationships. Moreover, the task of tapping into individual passion, intelligence, and creativity will ease as it should be recognized that the human brain is a social organ of adaptation (Cozolino, 2014). As a social organ, human brains have

evolved to be linked to and learn from other brains in the context of significant relationships (Cozolino, 2014). Therefore, an organization developed upon healthy social relationships and opportunities for individuals to connect neurologically is more likely to generate productive results.

The participation of multiple brain regions through adulthood allows for more inclusive and deeper consideration that serves increasing knowledge and problem-solving abilities (Cozolino, 2014). In *The Integrative Mind: Transformative Education for a World on Fire*, Hart (2014) asserts that for individuals to deal with the enormous complexity on the outside, they need a deep enough inner life. In the evolving and complex world of education, the great deal of information, technology, and demands from the world around us, the more essential is our interiority, that is, the inner capacities for creativity, imagination, character, emotional balance, and more (Hart, 2014).

Implications

The concept of leadership that has been expressed revolves around a theme of empathy. An educational leader must empathize with teachers, administrators, staff, family, students, and other collaborators in their community to bring about positive change. As individuals are utilizing healthy relationships and navigating through the complexity of the educational world, they must be

empathetic to one another to maintain those positive relationships. The empathetic mind allows us to begin to see from multiple points of view, to share and learn from one another, rather than just defend our own views (Hart, 2014). It remains imperative that generative leaders acknowledge and embrace complexity science. In addition, it is beneficial to understand the impact of neurological connections amongst the relationships of the individuals in a community. With these aspects in mind, we can move closer to bringing about quality collaborative change in education.

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