Integration as Emergence

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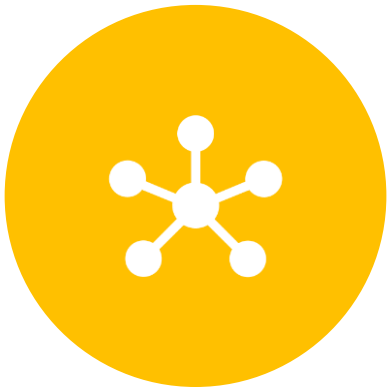
Interdisciplinary Core Competencies

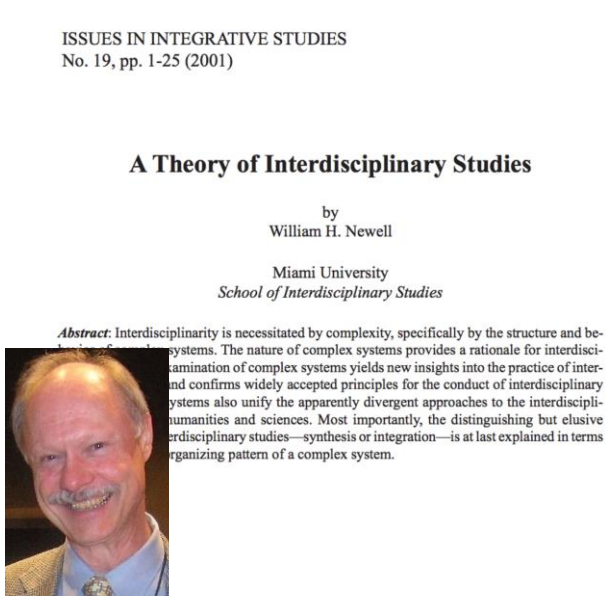
PERSPECTIVE TAKING/HOW WE SEE

CRITICAL THINKING/HOW WE THINK



INTEGRATION/HOW WE DO

Complexity and Interdisciplinarity



ISSUES IN INTEGRATIVE STUDIES
No. 19, pp. 1-25 (2001)

A Theory of Interdisciplinary Studies

by
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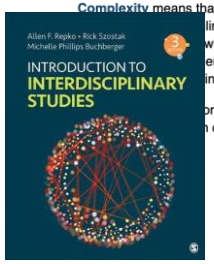
Abstract: Interdisciplinarity is necessitated by complexity, specifically by the structure and be-
systems. The nature of complex systems provides a rationale for interdisci-
amination of complex systems yields new insights into the practice of inter-
nd confirms widely accepted principles for the conduct of interdisciplinary
ystems also unify the apparently divergent approaches to the interdisciplin-
umanities and sciences. Most importantly, the distinguishing but elusive
rdisciplinary studies—synthesis or integration—is at last explained in terms
rganizing pattern of a complex system.



THEORIES SUPPORTIVE OF INTERDISCIPLINARY STUDIES

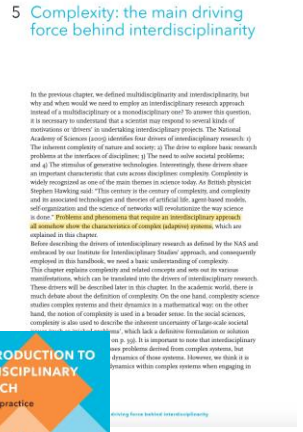
Theory refers to a generalized scholarly explanation about some aspect of the natural or human world, how it works, and how specific facts are related that is supported by data and research (Bailis, 2001, p. 39; Calhoun, 2002, p. 482; Novak, 1998, p. 84). An example of a theory is "the broken window theory of crime." It communicates the idea that seemingly trivial acts of disorder such as a broken window in a vacant house tend to trigger more serious crime in the neighborhood.

All disciplines embrace certain theories that provide their intellectual core and give them coherence. This is true also of interdisciplinary studies whose theories provide justification for using an interdisciplinary approach, establish that interdisciplinarity is both feasible and desirable, and inform the interdisciplinary process. This section examines the theories of complexity, perspective taking, common ground, and integration upon which many of the core concepts of interdisciplinarity are based. These theories are crucial to establishing the intellectual validity of interdisciplinary studies.

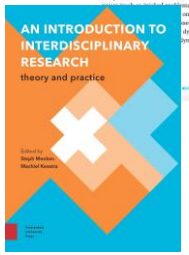
Complexity Theory

Complexity means that there are multiple parts of a system that are connected and interact in sometimes
linear) ways with each other. Interdisciplinary complexity theory states that interdisciplinary
when a problem or issue is multifaceted and functions as a "system" (see Boxes 6.3 and
ere, "system" does not imply that the system is stable or that it acts independently of other
in reality, almost all phenomena influence almost all other phenomena somehow.)

on of why complexity should be a criterion for interdisciplinary studies. The answer involves
of interdisciplinary studies provided in Chapter 3, noting two of its key elements:



5 Complexity: the main driving force behind interdisciplinarity



Restricted Complexity: "One avoids the fundamental problem of complexity which is epistemological, cognitive, paradigmatic. To some extent, one recognizes complexity, but by decomplexifying it." Edgar Morin

*"Restricted Complexity, General Complexity" in Gershenson, Carlos, Diederik Aerts, and Bruce Edmonds. *Worldviews, Science and Us: Philosophy and Complexity: University of Liverpool, UK, 11-14 September 2005*. World Scientific, 2007, 5-29.

Phenomena or Process

Peer-Reviewed Article

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How Interdisciplinarians Work

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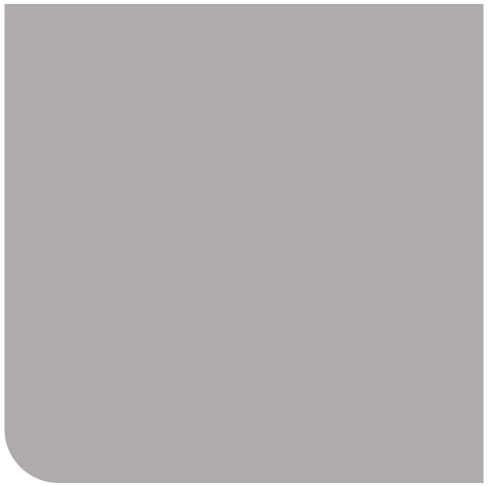
ABSTRACT

This paper reports on a study of what interdisciplinarians do. Data was gathered by conducting semi-structured interviews with self-identified interdisciplinarians. Several themes emerged from this project. First, the principal approach to research by interdisciplinarians was broadly exploratory and messy contrary to the linear step-by-step approach often promoted. Most interdisciplinarians in this project paid little homage to disciplines or disciplinary structures and often explored disparate knowledge domains including domains outside the normal purview of academe. The role of mentorship and community was crucial for many in the development of the participants' identity and skills and despite best intentions, many conveyed a gap between what they do and what they teach. Closing this gap should improve IDS teaching and learning.

Keywords: interdisciplinary studies, interdisciplinary methodology, complexity



The complexities of interdisciplinarity: Integrating two different perspectives on interdisciplinary research and education

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University of Ottawa (Canada)

The aim of this article is to open a conversation between the complexity & education community and the field of interdisciplinarity (as well as its close relative, interprofessionalism). It starts by describing two very different streams of thought in the literature on interdisciplinary research and education. One that focuses on the socio-cultural dynamics among disciplinary 'knowers' and one that emphasizes the complexity of the phenomena studied by these disciplinary knowers. Next, the author argues that recent epistemological thinking associated with the complexity & education community can help to integrate these streams of thought—offering a way for interdisciplinary inquiry to respect both the complexity of knowers and the complexity of the known.

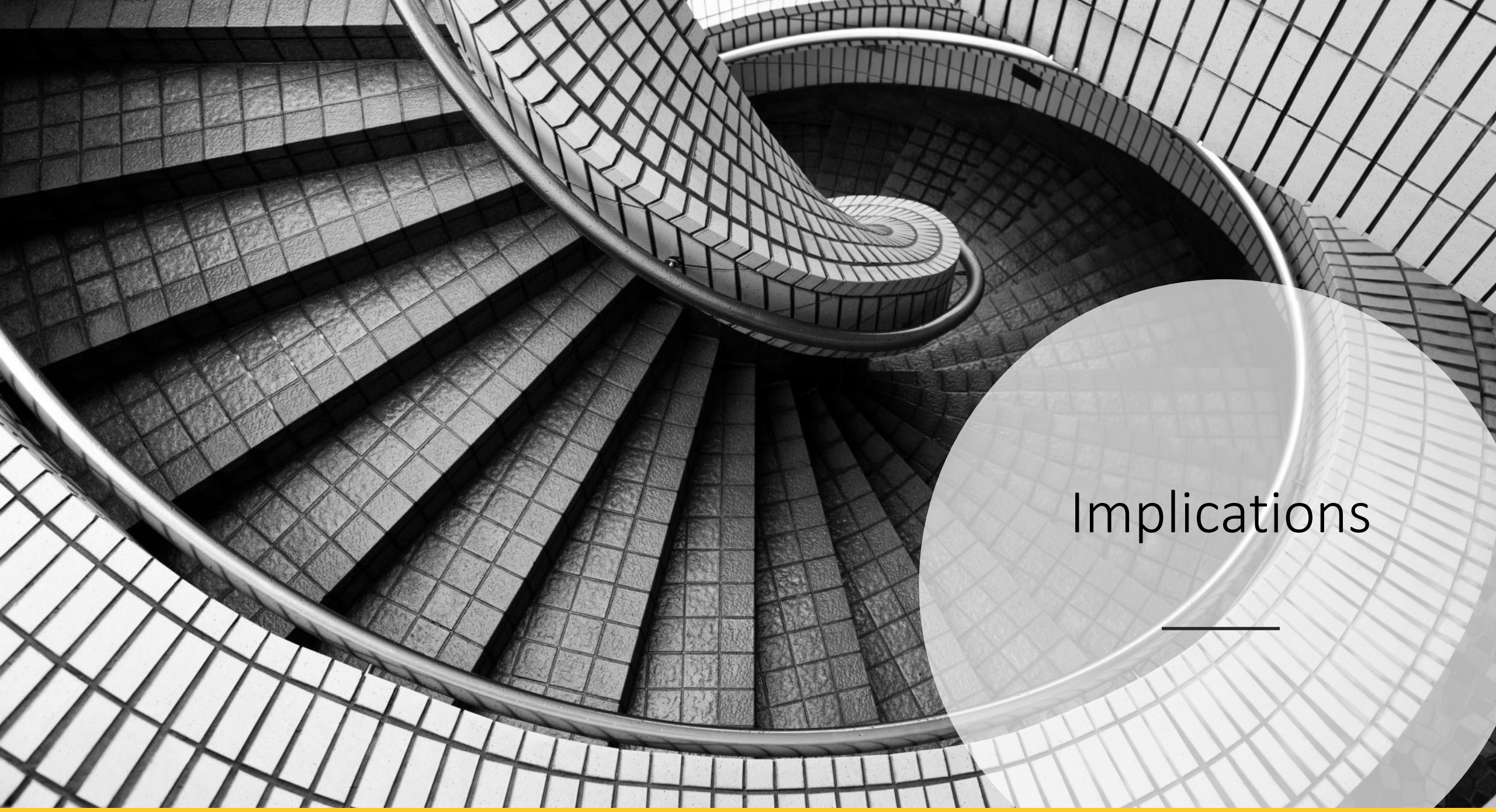
Introduction

Interdisciplinarity and interprofessionalism are topics of growing concern in higher education institutions. Faced with multifaceted problems like climate change and poverty, many researchers and educators have explicitly adopted interdisciplinary outlooks. In healthcare professional schools across the developed world, practitioners are being trained for work in interprofessional teams—teams that policymakers hope will be more effective in providing care for complex health issues like diabetes.[1] Not

[1] In Canada, for example, the establishment of interdisciplinary teams is one of the five pillars of Health Canada's current $800 million push to reform primary health care (Health Canada, 2005).

Complexity Theory

- Agents/elements/variables
- Feedback Loops
- Self-organizing
- Emergent properties
- Non-linear



Implications

Metaphors of Interdisciplinarity

“Consciousness and reality are engaged in a complex feedback loop that is fluid, dynamic, and essentially ungrounded,” Welch IV 2012, 119

“The mind processes reality through the integrative assimilation of complexity, and this provides an ontological basis for interdisciplinary theory and practice,” Welch IV 2012, 121

“This practice of holding different ways of knowing *in relationship* is how thinking becomes interdisciplinary the ways of knowing act on each other--we cannot predict how-- but that process is often for tile if we pay attention,” Dreyfuss, Simeon 2011, 74.

Integration

Process/Product

Unpredictable

Novelty

Self as Method

“Skill at interdisciplinary work thus becomes a matter of character rather than methodology. Interdisciplinary work requires the development of a peculiar set of virtues… we acquire such virtues through embodying them in a practice until they become part of us. Interdisciplinary projects thus make peculiar psychological and even spiritual demands upon participants.”

Frodeman 2013, 48

Teaching and Learning Interdisciplinarity

- Experience
- Engagement
- Cognitive toolkit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