

Chapter 12

Issues and Challenges in Interdisciplinary: Methodological Barriers

Siraj K. K.

Ibra College of Technology, Oman

Azzah Al-Maskari

Ibra College of Technology, Oman

ABSTRACT

The need for interdisciplinary studies to address the complex issues, too broad to deal adequately by a single discipline, is widely acknowledged in literature. Many issues in modern days such as climate change, food security and energy crisis, are interdisciplinary in nature. The success of interdisciplinary studies depends on ‘collaboration’ and ‘synthesizing mind’ among researchers in different disciplines. Research studies have identified disciplinary focus, assumptions, theories and practices, research design, and methodological pluralism as the major sources of conflict in an interdisciplinary context. In particular, the chapter discusses the various methodological barriers such as differing methodological approach, conflicting research findings, methodological pluralism, terminological problems, time barriers, and diverse motivations in interdisciplinary studies. Based on analysis, the chapter provides few recommendations to address methodological barriers and to promote collaboration and integration among members from various disciplines involved in interdisciplinary studies.

INTRODUCTION

Interdisciplinary research is defined as a mode of research by teams or individuals that integrates perspectives/concepts/theories and/or tools techniques and/or information/data from two or more bodies of knowledge or research practice (Porter & Rafols, 2009). The role of interdisciplinary research, by integrating insights and learning’s from different disciplines working in collaboration with each other to address a complex research problem like sustainable development, alternate sources of energy, food security (Morse et al., 2007; Bililign, 2013); climate change and curing cancer (Olsen et al., 2013); sus-

DOI: 10.4018/978-1-5225-3878-3.ch012

tainable energy struggle (Riper et al., 2012); food, water and energy security (Ignaciuk, et al., 2012) is well acclaimed in academic literature. Also, the awareness that many of the scientific problems ‘cannot be compartmentalized into arbitrary disciplinary structures’ contributed to the growth of interdisciplinary research. Acutt et al. (2000) cited examples of interdisciplinary studies involving social and natural sciences in order to solve environmental problems. Fleischmann et al. (2013) tried to bring two groups together: social scientists (who study social phenomena broadly or deeply) and computer scientists (who have computational approaches) in order to balance the trade-off between depth and breadth in an interdisciplinary study. Similarly Ignaciuk et al. (2012) mentioned that the non-linearity and complexity of natural and social processes are recognized and policy makers pose questions for which solutions require collaboration between various fields. An example is a research focused on problems of food, water and energy security. These research studies need to be tackled in more holistic ways, allowing for a variety of different systemic feedback and inclusion of the expertise of many different disciplines. Brister (2016) observed that the complex environmental problems require well-researched policies that integrate knowledge from both the natural and social sciences. Thus, the progress gained from viewing a research problem in its entirety stimulated many researchers into interdisciplinary research. Funding agencies and institutions are creating initiatives to encourage interdisciplinary research (Gill et al., 2015).

Klein and Newell (1997) explained interdisciplinary research as a process of answering a question, solving a problem, or addressing a topic that is too broad or complex to be dealt with adequately by a single discipline. It draws on disciplinary perspectives and integrates their insights through construction of a more comprehensive perspective. Chettiparamb (2007) commented that the arguments for interdisciplinarity generally stems from debates surrounding disciplinarity. Two main threads are found in these debates. The first arguments consider interdisciplinarity normatively, positioning it in terms of filling the gaps that disciplinarity leaves vacant or in terms of transcendence surpassing disciplinarity can ever hope to achieve. The second thread posited that interdisciplinarity already exists within disciplines. The argument further explains that the space for interdisciplinary studies is not just out there – interdisciplinary activities may be in the heart of disciplinary practice (Klein, 2000).

Effective collaboration between people from different disciplines is necessary to maximize the potential benefits of interdisciplinarity for future research activity (Bridle et al., 2013). Interdisciplinary studies are the only way to dismantle the inherent power structures created by disciplinary boundaries (Lattuca, 2001). In this way, it is closely associated with postmodernist paradigm, but unlike postmodernists does not reject all advancements created by the disciplinary focus. The focus of interdisciplinary research is on those research problems whose solutions cannot be identified within a single discipline (Visholm et al., 2012) and the research questions are determined by shared understanding in an interactive and iterative process (Canadian Academy of Health Sciences, 2005).

The benefits of interdisciplinary research over undisciplinary research are many, though several barriers and challenges prevail. Development of new collaborations and building research ideas (Taylor, 2004) and transfer of benefits and outcomes to a broader audience (Kelley & Randolph, 1994) are key advantages. Interdisciplinary research in natural and social sciences, of course, has to overcome many issues and challenges resulting from different reasons, ex; the differing expectations of research team (Campbell, 2005), methodological barriers (Lach, 2014; Szostak, 2007; Gooch, 2005; Lele & Norgaard, 2005; Gilbert, 1998), communication barriers (O’Rourke et al., 2014; Lah et al., 2013; Aboelela et al., 2008; Bracken & Oughton, 2006; Miller, 2011), and philosophical obstacles (Niglas, 2009; Morse, 2005; Onwuegbuzie & Johnson, 2006).

19 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

www.igi-global.com/chapter/issues-and-challenges-in-interdisciplinary/190518

Related Content

U.S. Army Trainers: The Path to Becoming a Trainer and the Development of Professional Identity

Steven W. Schmidt (2018). *Critical Theory and Transformative Learning* (pp. 213-228).

www.irma-international.org/chapter/us-army-trainers/206138

Electric Vehicle Fleet Management Using Ant Colony Optimisation

Javier Biera Murieland Abbas Fotouhi (2020). *International Journal of Strategic Engineering* (pp. 1-16).

www.irma-international.org/article/electric-vehicle-fleet-management-using-ant-colony-optimisation/243665

Enacting a Cycle of Inquiry Capstone Research Project in Doctoral-Level Leadership Preparation

Shelby Cosner, Steve Tozerand Paul Zavitkovsky (2016). *Contemporary Approaches to Dissertation Development and Research Methods* (pp. 162-183).

www.irma-international.org/chapter/enacting-a-cycle-of-inquiry-capstone-research-project-in-doctoral-level-leadership-preparation/156937

Frienemies: Assessing the Interactions between Native American Tribes and the U.S. Government in Homeland Security and Emergency Management Policy

Leigh R. Anderson (2014). *Cases on Research and Knowledge Discovery: Homeland Security Centers of Excellence* (pp. 124-151).

www.irma-international.org/chapter/frienemies/106881

Strategies for Lessening the Cognitive Load of Graduate Students Engaged in Major Writing Projects

Shirley Marie Matteson (2021). *Handbook of Research on Developing Students' Scholarly Dispositions in Higher Education* (pp. 251-274).

www.irma-international.org/chapter/strategies-for-lessening-the-cognitive-load-of-graduate-students-engaged-in-major-writing-projects/285122