

Cold War Moosonee: An Interdisciplinary Approach to Studying a Small, Northern, Cree Community

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Abstract: This article describes the interdisciplinary basis for research on the impact of the Cold War on Moosonee, Ontario. It examines four areas:

- a) The difference between interdisciplinarity and monodisciplinarity,
- b) The evolution of interdisciplinarity,
- c) Approaches to interdisciplinary research and education, and
- d) Interdisciplinary methods.

The paper concludes with a discussion of why an interdisciplinary approach is the most appropriate way to study Moosonee in the Cold War era.

Keywords: interdisciplinarity; monodisciplinarity; interdisciplinary methods; Cold War; Moosonee

Résumé : Cet article décrit les fondements interdisciplinaires pour la recherche sur l'impact de la guerre froide sur Moosonee, Ontario. Il examine questions:

- a) La différence entre interdisciplinarité et monodisciplinarité,
- b) L'évolution de l'interdisciplinarité,
- c) Les recherches sur l'éducation et l'interdisciplinarité, et
- d) Les méthodes de l'interdisciplinarité.

Cet article conclut sur une discussion au sujet de la question suivante : Pourquoi est-ce que l'interdisciplinarité est la meilleure méthode pour étudier Moosonee durant la période de la guerre froide?

Mots-clés : interdisciplinarité; monodisciplinarité; méthodes; guerre froide; Moosonee

This paper discusses various aspects of interdisciplinary research and why an interdisciplinary approach is being used for research on Moosonee. Specifically, the first part of the paper addresses the difference between disciplinary research and interdisciplinary work, the evolution of interdisciplinarity, approaches to interdisciplinary research and education, and methodological issues. The second half of the paper outlines why an interdisciplinary approach is the most appropriate way to study Moosonee during the Cold War.

Disciplines and Monodisciplinarity

Interdisciplinary writers have, surprisingly, focused a considerable amount of their work on the evolution of disciplines, rather than on the development of interdisciplinary studies.¹ This focus is reasonable given that interdisciplinary scholars tend to come from disciplinary backgrounds and utilize disciplines in their interdisciplinary research. For example, Joe Moran, an English and Cultural History Professor at Liverpool John Moores University, includes several chapters on the evolution of English, Literary Studies and Linguistics in his recent text, *Interdisciplinarity*. Although Moran describes “a discipline” as “a particular branch of learning or (a) body of knowledge,”² he does not represent disciplines as static entities but instead shows how disciplines are continually re-structuring. James Chandler, the Director of the Franke Institute for Humanities (Chicago) suggests that individual disciplines are not defined solely by subject matter. Instead he writes

¹ See Julie Thompson Klein, *Humanities, Culture and Interdisciplinarity* (Albany: State University of New York, 2005) ; James Chandler, “Introduction: Doctrines, Disciplines, Discourses, Departments,” *Critical Inquiry* 35, no. 4 (2009): 729-748, W.J.T. Mitchell, “Interdisciplinarity and Visual Culture,” *Art Bulletin* 77, no. 4 (1995): 540-544 and Joe Moran, *Interdisciplinarity* (New York: Routledge, 2010). Also see Allen Repko, *Interdisciplinary Research: Process and Theory* (Los Angeles: Sage Publishing, 2012), 92-141.

² Moran, 2.

that disciplines are characterized by both shared “styles of thought” and shared “practices.”¹ Marilyn Strathern echoes Chandler’s writing as she states that disciplines are “ways of keeping distinct the origins not just of ideas and materials, but of work practices, lines of authentication and accountability.”² Strathern is a Professor of Social Anthropology at Cambridge and the author of *Commons and Borderlands*, a collection of papers on both Interdisciplinarity and the “Flow of Knowledge.” Like Moran, Strathern writes about change within disciplines, although Strathern’s particular interest is in the role of modern technologies and scientific disciplines, rather than the Humanities.

Some writers have taken an almost aggressive stance against disciplinary work. For example, Allen Repko, who has produced one of the few university textbooks on interdisciplinary studies, seems to suggest that disciplinary research is inferior to interdisciplinary work. He writes that disciplines reflect “monodisciplinarity” which is “the tendency to view a problem primarily from the perspective of the discipline in which the researcher is grounded while discounting or rejecting other disciplinary perspectives.”³ Repko’s rather harsh definition of monodisciplinarity ignores the fact that academics often focus on their own discipline(s) and pay less attention to other disciplines, rather than actually “discounting” or “rejecting” them. Edgar Morin, the French philosopher, who produced over 30 texts on the organization of knowledge and disciplines (between 1951 and 2011), also railed against monodisciplinarity. Morin was highly critical of disciplinary research

¹ Chandler, 732. See also the concluding chapter in Tanya Augsborg and Stuart Henry, *The Politics of Interdisciplinary Studies* (Jefferson: McFarland and Company, 2006), 227 where these authors describe disciplines as having their own “disciplinary culture.” They also indicate that “Disciplines regulate how their discourses, concepts, theories, methods, and research are preserved and disseminated.”

² Marilyn Strathern, *Commons and Borderlands: Working Papers on Interdisciplinarity, Accountability and the Flow of Knowledge* (Oxon: Sean Kingston Publishing, 2004), 45.

³ Repko, *Interdisciplinary Research*, 274.

or what he termed “hyper-specialization,” particularly in the sciences, and he felt that knowledge and “key realities ...slip through the cracks between disciplines.”¹ Morin also theorized in his 1994 text *On Complexity* that “blind intelligence,” or the separation of science from philosophy and other bodies of knowledge, had resulted in threats such as thermonuclear war.²

More recently Peter Weingart, former director of the German ZiF (Centre for Interdisciplinary Research) suggested there was a “contradictory pattern” in our discussion of disciplinary change. He stated that “interdisciplinarity is proclaimed, demanded, hailed, and written into funding programs, but at the same time specialization in science goes on unhampered.”³ Weingart’s writing suggests that he expected scientific disciplines to meld or ‘bridge’ with other disciplines over the past few decades rather than to “hyper-specialize” as predicted by Morin.

Despite varying opinions on the positive and negative aspects of disciplinary work, it is generally understood that Interdisciplinary Studies depend on disciplines for their base. William Newell, who edited one of the first collections of interdisciplinary writing, *Interdisciplinarity: Essays from the Literature* (1998), emphasized that “interdisciplinary courses depend on the disciplines for their perspectives as much as disciplinary courses depend on interdisciplinary ones to provide context.”⁴ The

¹ Edgar Morin, *On Complexity* (Cresskill: Hampton Press, 2008), 4. (This text was first published in 1994 and only translated into English in 2008).

² *Ibid.*, 2.

³ Peter Weingart, “Interdisciplinarity: The Paradoxical Discourse,” In *Practising Interdisciplinarity*, eds. Peter Weingart and Nico Stehr (Toronto: University of Toronto Press, 2000), 26.

⁴ William Newell, “Academic Disciplines and Undergraduate Interdisciplinary Education,” In *Interdisciplinarity: Essays from the Literature*, ed. W. Newell (New York: The College Board, 1998), 224. See also Augsburg and Henry (251) who referred to interaction between monodisciplinary academics and interdisciplinary researchers as “a symbiotic

interaction between the disciplines is discussed in the next section of this paper as part of the evolution of interdisciplinary studies.

The Evolution of Interdisciplinarity

Interdisciplinary writers tend to cite the 1970 conference on Interdisciplinarity, organized by the Organization for Economic Co-operation and Development (OECD), as a beginning point or catalyst for interdisciplinary studies.¹ This conference brought together a wide range of scholars from Europe and North America and resulted in the 1972 publication of the text *Interdisciplinarity: Problems of Teaching and Research in Universities* by the Centre for Education Research and Innovation (CERI).² The title of the text implies that it was just about “problems,” however the writers also discussed why interdisciplinarity was needed at the start of the 1970’s and how standard definitions could assist with the formation of courses and fields of study. One of the reasons they promoted interdisciplinary studies was that they felt it might “defuse the student rebellion” against monodisciplinary studies which seemed increasingly irrelevant to young students as they observed the worldwide energy crisis, the Czechoslovakia of

relationship.” They hypothesized that university interdisciplinary programs which did not interact with disciplinary programs risked dissolution.

¹ On the OECD conference and 1972 compendium which resulted from the conference, see Liona Salter and Alison Hearn, eds. *Outside the Lines: Issues in Interdisciplinary Research* (Montreal: McGill-Queen’s University Press, 1996; Peter Weingart and Nico Stehr, (eds) *Practising Interdisciplinarity*, (Toronto: University of Toronto Press, 2000); Kathryn Shailer, “Interdisciplinarity in a Disciplinary Universe: A Review of Key Issues,” (Council of Ontario Universities, 2005); Klein, *Humanities*.

² The Centre for Educational Research and Innovation (CERI) functions as part of the Organization for Economic Co-operation and Development (OECD). Julie Thompson Klein referred to the 1970 Nice, France OECD symposium as “the first international conference” on Interdisciplinarity (see Julie Thompson Klein, *Humanities*, 55).

1968, and the ongoing war in Vietnam (1960's/ early 1970's).¹ The editors of the OECD/CERI text proposed a set of definitions for future research as follows:

Multidisciplinary: Juxtaposition of various disciplines, sometimes with no apparent connection between them (e.g. music and mathematics and history).

Pluridisciplinary: Juxtaposition of disciplines assumed to be more or less related. (e.g. mathematics and physics ...)

Transdisciplinary: Establishing a common system of axioms for a set of disciplines.

Interdisciplinary: An adjective describing the interaction between two or more disciplines. This interaction may range from simple communication of ideas to the mutual integration of organizing concepts, methodologies, procedures, epistemology, terminology, data, and organization of research and education in a fairly large field. An interdisciplinary group consists of persons trained in different fields of knowledge (disciplines) ... organized into a common effort on a common problem with continuous intercommunication among the participants...²

By 1982, CERI focused more on the distinctions between internal academic (endogenous) studies and external (exogenous) community and problem-based research. The authors of a second CERI/OECD text on the role of universities, *The University and the Community: the Problems of Changing Relationships*, concluded that exogenous research was increasing at a faster rate than endogenous studies because the former dealt with “real problems” such as the environment and health. In the chapter entitled “Communities Have Problems, Universities Have Departments” the example of health and medical research is used to show how external research enriches academic study and

¹ Leo Apostel, Guy Berger, Asa Briggs and Guy Michaud (eds), *Interdisciplinarity: Problems of Teaching and Research in Universities* (Paris, OECD, 1972), 12.

² *Ibid.*, 25-26. The definition of transdisciplinarity seems somewhat incomplete. For example, the term “axioms” is not defined but it is assumed to mean a set of common principles.

how interdisciplinary studies could be improved by structuring more effective university curricula, based on real-life situations.¹

Since the publication of the OECD/CERI texts, several writers have supplemented the 1972 definitions. Moran has further defined interdisciplinarity as “any form of dialogue or interaction between two or more disciplines.”² Julie Thompson Klein, a Professor of Humanities at Wayne State University (Detroit) and a frequent author on interdisciplinarity, has also written on multidisciplinary which she says groups disciplines so that they “speak as separate voices in an encyclopedic alignment.”³ In other words, separate disciplines are dealt with in a linear fashion where they are “beside” each other, but where there is a lack of interaction or integration. Klein concluded in her later writing that the concept of “integration of disciplines” was the “litmus test” of Interdisciplinarity.⁴ That is, without integration,

¹ Guy Berger and Pierre Duguet, “Communities Have Problems, Universities Have Departments,” In *The University and the Community: The Problems of Changing Relationships*, (Paris, OECD, 1982), 130-133. Shailer(2005) implies that Julie T. Klein developed the terms ‘endogenous’ and ‘exogenous’, however Klein’s 1996 text makes it clear that she was critiquing terms used by the OECD/CERI. See Julie Thompson Klein, *Crossing Boundaries: Knowledge, Disciplinarity, and Interdisciplinarity* (Charlottesville: University Press of Virginia, 1996), 12-13.

² Moran, 14. Underline mine. Angelique Chettiparamb, *Interdisciplinarity: A Literature Review* (University of Southampton: The Interdisciplinary Teaching and Learning Group, 2007) suggests that the definition of interdisciplinarity includes the process of “...disciplines latching on to common elements.” (26).

³ Klein, *Humanities*, 55.

⁴ Julie Thompson Klein, “A Taxonomy of Interdisciplinarity” In *The Oxford Handbook of Interdisciplinarity*, eds Robert Frodeman, Julie Thompson Klein, and Carl Mitcham (New York: Oxford University Press, 2010), 16-17. Also see Karen Messing, “Easier Said Than Done: Biologists, Ergonomists, and Sociologists Collaborate to Study Health Effects of the Sexual Division of Labour,” In Liona Salter and Alison Hearn, eds. *Outside the Lines: Issues in Interdisciplinary Research* (Montreal: McGill-Queen’s University Press, 1996), 95-102.

any discussion of two or more disciplines is sufficiently multidisciplinary but does not meet the definition of “interdisciplinary.” Thirty-five years after CERI developed initial definitions; a group of research associates at Columbia University (New York) conducted an extensive literature review and interviews of interdisciplinary researchers in order to develop a new definition of interdisciplinarity. The team lead for this project, Dr. Sally Aboelela, is a Research Associate of the Centre for Interdisciplinary Research on Antimicrobial Resistance at Columbia. Aboelela and her associates recommended the use of the following definition for interdisciplinary work:

Interdisciplinary research is any study or group of studies undertaken by scholars from two or more distinct scientific disciplines. The research is based upon a conceptual model that links or integrates theoretical frameworks from those disciplines, uses study design and methodology that is not limited to any one field, and requires the use of perspectives and skills of the involved disciplines throughout multiple phases of the research process.¹

While the definition presented by Aboelala et al initially appears to be limited to the physical sciences, these authors explained that their goal was to provide a base for scholars in health sciences, social sciences, business, and education. They also indicated that a firm definition was needed to ensure that interdisciplinary curricula provided the basic structure needed by students and researchers.

As definitions were developed and research proceeded, certain academics began to look for change within universities. One of the earlier writers on the changing interaction between disciplines was Clifford Geertz who in 1980 examined what he called the “uncertain line” between

¹ Sally Aboelela et al, “Defining Interdisciplinary Research: Conclusions from a Critical Review of the Literature, *Health Sciences Research* 42, (February 2007): 341.

Humanities and Social Sciences.¹ As a social scientist at Princeton's Institute for Advanced Study, Geertz felt his work could benefit from closer examination by academics in the Humanities, and he postulated that "the lines grouping scholars together into intellectual communities, or (what is the same thing) sorting them out into different ones, are (shifting)."² More recently, Chandler commented on the evolution of changing academic relationships, and the "shifting" or transition which had been observed decades earlier by Geertz. He noted:

Where thirty years ago one's academic culture typically consisted in various forms of collegial exchange within the departments, increasingly one looks for collegial collaboration outside the department, and to exaggerate the situation slightly, we sometimes seem to meet as a department only when there are specific careers at stake, that is to say, when reviewing cases for hiring or promotion.³

By their observations, both Geertz and Chandler affirmed that the evolution of interdisciplinarity changed both disciplinary boundaries and everyday communications.

Approaches to Interdisciplinarity Research and Education

Since the 1982 publication of *The University and the Community*, with its differentiation between exogenous and endogenous research, a variety of writers have proposed and critiqued approaches to interdisciplinarity. Liora Salter and Alison Hearn's 1996 text *Outside the Lines* is a noted Canadian publication that not only describes early

¹ Clifford Geertz, "Blurred Genres: The Refiguration of Social Thought" In *Interdisciplinarity: Essays from the Literature*, ed. William Newell (New York: The College Board, 1998), 233. This article was first published in 1980 in *The American Scholar* 49, no. 2 (1980): 165-179.

² *Ibid.*, 228. As an example of change, Geertz indicated that social scientists no longer studied "...the dynamics of collective life (in order to) alter them in desired directions" but in order to gain a better understanding of such life. (236-237).

³ Chandler, 736-737.

approaches to interdisciplinarity but also provides clear examples of both academic and industrial applications. This book merged Salter's expertise in Law and Environmental Studies with Hearn's background on Information and Media Studies to provide one of the more accessible publications on interdisciplinarity.¹ Specifically, Salter and Hearn added to the understanding of interdisciplinary approaches with their comparisons of "instrumental" and "conceptual" interdisciplinarity. Instrumental interdisciplinarity focuses on "borrowing methods and tools from across the disciplines" in order to solve specific problems. Conceptual interdisciplinarity has at least two forms. It includes researchers who recognize the need for a "basis in the disciplines" but want this combined with "nondisciplinary activity," and an opposing group that wants to see knowledge production without any reliance on traditional disciplines.²

Weingart also suggests that there are two types of interdisciplinary research; one academic, and the other problem-based.³ W.J.T. Mitchell, an Art and English professor at University of Chicago, described research approaches in a somewhat similar way to Weingart as "top-down" interdisciplinarity, which corresponds to the idea of a unity of knowledge and "bottom-up" interdisciplinarity which is intended to resolve a specific issue. Mitchell indicated that "bottom-up" work "emerges on the shop floor, as it were, in response to emergencies and opportunities."⁴ Klein provides a broad perspective on all of these approaches

¹ Dr. Liora Salter is cross-appointed with the Faculty of Environmental Studies at York University and with Osgoode Hall Law school. Alison Hearn is an Associate Professor in the Faculty of Information and Media Studies at University of Western Ontario.

² Salter and Hearn, 30-31. "Nondisciplinary activity" is not defined in this section by Salter and Hearn, but Repko suggests that "nondisciplinary" material includes traditional knowledge, such as that conveyed by indigenous elders from generation to generation. See Repko, *Interdisciplinary*, 189.

³ Peter Weingart, "Interdisciplinarity", 39.

⁴ W.J.T Mitchell, "Interdisciplinarity and Visual Culture," *Art Bulletin* 77, no. 4 (1995): 541.

with her suggestion that distinctions between interdisciplinarity approaches are “not absolute.”¹

Discussions on interdisciplinarity are often combined with writing on transdisciplinarity, an approach which appears to be further challenging research and academic boundaries, because as Strathern writes; transdisciplinary research “does not just disrespect disciplinary boundaries – it disrespects institutional ones too.”² What she means by this is that transdisciplinarity goes beyond academic boundaries to include non-academic stakeholders and members of the public. Strathern suggests that interdisciplinary and transdisciplinary research can be a “phenomenon of crisis-response” for example, in dealing with issues such as Bovine Spongiform Encephalopathy (BSE or “mad-cow” disease).³ She also shows how complex some research has become in her description of the *Cambridge Genetics Knowledge Park*, a structure that integrates communication between 17 disciplines, commercial entities, consumers and the general public.⁴ Strathern’s examples of interdisciplinary approaches cover the range from work on military aircraft in the 1950’s, to the creation of plant-based anti-cancer drugs, and more recently to the examination of *New Reproductive Technologies* (NRT’s).⁵ She provides some of the broadest examples of approaches to interdisciplinary problem-solving in the literature reviewed for this paper. Klein writes that transdisciplinary projects, like Strathern’s, are a “collaborative form of

¹ Klein, “Humanities,” 58.

² Strathern, 70.

³ Strathern, 3.

⁴ *Ibid.*, 16.

⁵ See Strathern, on interdisciplinarity and military work (21), on NRTs (6-7), and on anti-cancer drugs (19). Augsburg and Henry (228) conclude that the main role of interdisciplinary collaboration is to deal with “complex, contemporary issues.” Strathern’s examples clearly demonstrate this collaboration on key research, whether for military or for life-enhancing work.

interdisciplinary research,” which show effective results by involving stakeholders (e.g. patients) and members of the public.¹

Much of the literature on interdisciplinary approaches focuses on education systems, both at the undergraduate and graduate level.² Of particular interest is the recent text *The Politics of Interdisciplinary Studies* (edited by Tanya Augsborg and Stuart Henry) which is a collection of twelve reviews of interdisciplinary undergraduate approaches and programs.³ Augsborg, who is an Assistant Professor of Liberal Studies (Creative Arts and Humanities) at San Francisco State University and Stuart Henry, who is the Director of one of the largest American interdisciplinary programs (University of Texas at Arlington) examined all aspects of interdisciplinary programs from the relationship between disciplinary departments to the effect of economic decline on university interdisciplinary budgets. They admit that it is difficult to predict which programs will ultimately

¹ Klein, 287. Klein also provides detailed examples of transdisciplinary research in, “Research Integration: A Comparative Knowledge Base,” In *Case Studies in Interdisciplinary Research*, ed. Allen Repko, William Newell, Rick Szostak (Los Angeles: Sage Publications, 2012), 283-298. Her examples include a sustainable regional development project in Switzerland and an American Cancer study which brought together scientists, policy makers and community organizations to assess causal factors in disease.

² See, for example, William Newell, “The Case for Interdisciplinary Studies,” in *Interdisciplinarity: Essays from the Literature*, ed. W. Newell (New York: The College Board, 1998), 116. Newell’s paper was written in response to Thomas Benson’s, “Five Arguments Against Interdisciplinary Studies,” In *Interdisciplinarity: Essays from the Literature*, 103-108. Benson’s main concern was that undergraduate interdisciplinary students would not attain sufficient depth in disciplinary subjects. Newell’s response recognized that some students still needed specialized/mono-disciplinary training, but that others would benefit from a good understanding of more than one discipline.

³ Tanya Augsborg and Stuart Henry, eds *The Politics of Interdisciplinary Studies*, (Jefferson: McFarland & Company, 2009).

thrive but their discussions show that a wide range of approaches are used within interdisciplinary education systems.

Chandler has also discussed differing approaches to interdisciplinary education which he saw manifested in new academic fields which appeared after the late 1960's. Chandler's examples of these new fields, or what he called "shadow disciplines," included gender studies, media studies and race studies. He suggested that these new fields demanded "new contexts for collegial collaboration (and) new agendas for research."¹ Salter and Hearn's text *Outside the Lines* incorporates several papers describing approaches to early interdisciplinary education.² These papers include Jill Vickers's analysis of the Canadian Studies department at Carleton University and John Robinson's detailed description of the Environment and Resource Studies program at University of Waterloo.³ Vickers, the Director of the Institute of Canadian Studies, wrote a fascinating summary of the evolution of that program from 1958 to the early 1990's and showed how it adapted to both political and social change. Klein assessed the observations by Vickers as a "powerful lesson in practice."⁴ Robinson, a Professor in Environment and Resource Studies from 1981 to 1992, provided convincing detail on how the Waterloo approach satisfied the needs for both an undergraduate base in disciplinary work (primarily ecology)

¹ Chandler, 737. Klein, *Humanities*, (77) also referred to gender studies as an example of a relatively new interdisciplinary field

² Salter and Hearn, 7.

³ Jill Vickers, "Thirty-five Years on the Beaver Patrol: Canadian Studies as a Collective Scholarly Activity," in *Outside the Lines: Issues in Interdisciplinary Research*, eds. Liora Salter and Alison Hearn (Montreal: McGill-Queen's University Press, 1996), 78-84. John Robinson, "Falling Between Schools: Some Thoughts on the Theory and Practice of Interdisciplinarity," in *Outside the Lines*, 85-92.

⁴ Klein, *Humanities*, 68.

and the teaching of a skill set (statistics, writing, presentation skills) that could assist with resolving broad environmental issues.¹

More recently Svetlana Nikitina analyzed the approach used in the interdisciplinary neuroscience studies program at Harvard. While serving as a research specialist with Harvard Graduate School of Education, Nikitina described the requirement of professors and undergraduate students to be “boundary-crossers” as they took part in interdisciplinary work.² She also discussed the very normal hesitancy of some students to venture beyond their discipline(s), but she noted the “sense of discovery” and creativity of those participants who agreed to participate in interdisciplinary courses. Nikitina noted that part of the success of the program was the “internal disposition of students”³ who tended to be “intellectual omnivores with a broad palette of interests ... (including) music majors interested in biology and ... chemistry lovers with a penchant for asking philosophical questions.”⁴ Unfortunately, it is not creativity which ensures constancy or “survival” of interdisciplinarity programs, but rather the ability of various programs to deal with methodological training needs and associated issues.

¹ Robinson used the term “numeracy” instead of “statistics” but as a graduate of the program, I understand his term to mean the latter. William Newell used Environmental Studies as an example of an interdisciplinary program with a “clear substantive focus.” See W. Newell, “The Political Life Cycle of a Cluster College,” In *The Politics of Interdisciplinary Studies*, eds Tanya Augsberg and Stuart Henry (Jefferson: McFarland & Company, 2009), 47.

² Svetlana Nikitina, “Navigating the Disciplinary Fault Lines’ in Science and in the Classroom: Undergraduate Neuroscience Classroom in Mind, Brain, and Behavior at Harvard,” *Issues in Integrative Studies* 20 (2000), 31.

³ *Ibid.*, 41.

⁴ *Ibid.*, 31.

Interdisciplinary Methods and Related Issues

Writers on interdisciplinarity tend to be split into two groups; those who wish to see agreement on a distinct set of “steps” or “methods” for conducting interdisciplinary work, and those who feel that too much definition stifles the potential creativity which is possible with interdisciplinary studies.

The value of a steps-based approach to interdisciplinarity has been described by a number of authors. Allen Repko analyzed the steps proposed by William Newell, Julie Thompson Klein and Rick Szostak, three key interdisciplinary writers, in order to compare and contrast approaches. Repko determined that “consensus exist(ed)” on nine steps¹, as follows:

1. The problem or question must be defined,
2. Relevant disciplines and other resources must be identified,
3. Adequacy in each relevant discipline must be achieved,
4. Information from these disciplines (concepts, theories, methods, etc.) must be gathered,
5. The question must be studied and insights into the problem must be generated,
6. Conflicts between disciplinary insights must be identified,
7. Disciplinary insights must be evaluated and resolved and common ground must be created or discovered,
8. Integration must occur and an interdisciplinary understanding produced, (and)
9. The new understanding must be tested by applying it to the problem, issue, or question.²

¹ Repko identified, within the 9 steps, exactly which parts of the three models were similar. For example, Klein’s step 3a corresponded to Newell’s steps 5 and 6 and Szostak’s step 6. For comparison of individual sub-steps, reference should be made to Allen Repko, “Disciplining Interdisciplinarity: The Case for Textbooks,” *Issues in Integrative Studies* 24 (2006): 112-142.

² Repko, “Disciplining,” 122. Repko added another step to this group of nine. It is shown as “Step 2” in his “Integrated Model of the Interdisciplinary Research Process.”

Repko's analysis was a good critique of research options; however it appears to have dismissed the human or interpersonal aspects of interdisciplinary research. Specifically, Repko's combination of steps seems to neglect two key provisions. The first provision (proposed by Klein) was that interdisciplinary work required the resolution of "disciplinary conflicts by working towards a common vocabulary and focusing on reciprocal learning in teamwork."¹ The second (and similar) provision (recommended by Newell) was that conflicts needed to be resolved by "working towards a common vocabulary and set of assumptions."² Repko showed both of these steps in his background tables but he failed to bring the vocabulary and teamwork issues forward to his "Integrated Model." This is not to suggest that specific steps or stages in interdisciplinary research need to be "mandated" or "regulated," but it is important to ensure that personal communication and teamwork are recognized as critical parts of interdisciplinary work.³

J. Linn Mackey, a member of the Interdisciplinary Studies Faculty at Appalachian University (North Carolina), provided a critique of the "required steps" approach, using Rick Szostak's model as an example of interdisciplinary procedures. Mackey suggested that the value of interdisciplinarity was the ability to incorporate intuition and creativity

Step 2 requires the researcher to "Justify Using an Interdisciplinary Approach." See Allen Repko, *Interdisciplinary Research*, 74. Repko's textbook provides a high level of detail on terms and aspects for each of the ten steps in his Integrated Model.

¹ Repko, "Disciplining," 117.

² *Ibid.*, 118.

³ Klein, "Research", 290. Klein noted that Repko's writing "...focuses on the solo researcher." This is not stated as a criticism but as an explanation of why teamwork was not more extensively discussed in Repko's 2006 critique of models. My comparison of the first (2008) and second (2012) edition of Repko's textbook (*Interdisciplinary Research*) shows that, over time, he added material on vocabulary and communication to the background for his models. For example, in 2008 Repko stated that "It is sometimes necessary to create a common vocabulary." (284). By 2012, the word "sometimes" was removed (336).

into research work. Mackey also wrote that the emergence of new knowledge was not possible in a system that was too structured. He indicated that the essence of interdisciplinary work is the possibility of “emergence” which is “the appearance of something new, something unexpected.”¹

Other authors have commented on the difficulty of producing common vocabularies and/or understanding even basic terms used by other disciplines. As an example, Caroline Andrew, the former Chair of the Political Science Department at University of Ottawa, related how her use of the term “agency” was misunderstood by a reviewer of her manuscript on senior women managers. Andrew had intended to indicate that the women “exercised agency” or took control of their career path by making their own decisions. The reviewer (an economist) responded that the paper was confusing in its discussion of “agency theory (which)... deals with the way in which people behave as agents for others.” Andrew used this critique as an example of how a single word can be used by two disciplines in completely different ways and can therefore slow progress in interdisciplinary discussions unless there is agreement on terms at the beginning of research or academic work.²

Theodore Herschberg, the Director of the Center for Greater Philadelphia (at University of Pennsylvania), suggested that lack of teamwork, rather than differing vocabularies, was the reason for the failure of a major interdisciplinary project. The Philadelphia Social History Project

¹ J. Linn Mackay, “Rules Are Not the Way to do Interdisciplinarity: A Response to Szostak,” *Issues in Integrative Studies* 20 (2002): 126. Mackey was responding to Rick Szostak’s article “How to do Interdisciplinarity: Integrating the Debate.” *Issues in Integrative Studies* 20 (2002): 102-122.

² Caroline Andrew, “‘Agency’ or ‘Agencies,’ or Interdisciplinarity I Have Known,” in *Outside the Lines: Issues in Interdisciplinary Research*, ed. Liora Salter and Alison Hearn, (1996):52-53.

(PHSP) was an immense undertaking, between 1969 and 1985, which resulted in over 100 scholarly papers being produced by more than thirty researchers. Hershberg wrote that “the PHSP enjoyed a highly successful first phase in which it developed appropriate methodologies and constructed its data base.”¹ The project then moved into a “multi-disciplinary” stage which resulted in the production of specific analyses by labor historians, demographers, sociologists and others. The final stage of the PHSP was intended to be interdisciplinary, involving the full integration of work by different disciplines. However, Hershberg stated that:

The project’s final interdisciplinary research stage never materialized ... Participating researchers, despite the stated objective, never quite came to work as a *team*. They did not engage in a *shared* effort to define and write an interdisciplinary history of the city. This goal was never genuinely pursued.²

In describing a second major Philadelphia project, Hershberg implied that teamwork was again an issue in its partial failure. He noted that a strategic planning project had “several features to facilitate integration” but that “people simply were not interested” in reading about each other’s issues and “they failed to appreciate the value of their involvement in these integrative activities.”³ At first glance, it appears that Hershberg was observing the negative aspects of what Repko defined as “monodisciplinarity” (see earlier discussion in this paper). But realistically, as Hershberg noted himself, research participants were faced with the normal time constraints of professors who both teach and do research. He also noted that participants had to focus on other (disciplinary) research that was more directed toward their goal(s) of

¹ Theodore Hershberg, “The Fragmentation of Knowledge and Practice: University, Private Sector, and Public Sector Perspectives,” In *Interdisciplinarity: Essays from the Literature*, ed. W. Newell (New York: The College Board, 1998), 197.

² *Ibid.*, 198. (italics are Hershberg’s).

³ *Ibid.*, 202-203. Hershberg elaborates on the reasons for the lack of teamwork in his discussion of the “Philadelphia: Past, Present and Future” project.

obtaining tenure and establishing credibility within their home departments. This is a common theme for interdisciplinary writers and was noted throughout the materials reviewed for this paper.¹

It is clear that interdisciplinary literature deals with change both within, and beyond, disciplines. The inclusion of discussion on disciplines within interdisciplinary literature “makes sense” because most writers still come from a disciplinary background, and because disciplinary and interdisciplinary projects are intrinsically linked. Interdisciplinary literature also describes a variety of approaches in the areas of academic learning and external research, and a range from creativity-based work (Mackey, Nikitina) to “steps-based” research (Klein, Newell, Repko). My research on Moosonee was developed within the scope of “steps-based” research, but it also aimed for the creative insights possible within an interdisciplinary study.

An Interdisciplinary Approach to Research on Moosonee

My research asks the question: “What was the impact of the Cold War on northern Canada, and specifically on the community of Moosonee?” During the mid-1950’s three massive radar lines were constructed across the north: the Distant Early Warning (DEW) line, the Mid-Canada line, and the Pinetree line. The town of Moosonee experienced Cold War activity as early as 1955 when it became a shipping centre for more northerly Mid-Canada radar bases. That initial impact was compounded by the opening of Moosonee’s Royal Canadian Air Force (RCAF) base – a Pinetree radar site – in 1961. During the fourteen years the base operated in Moosonee, local Cree and non-indigenous people co-existed in a symbiotic relationship with the military personnel and families who lived on the radar base. My research

¹ The most complete discussions of time management and tenure issues are outlined in *Outside the Lines* (Salter and Hearn) and *The Politics of Interdisciplinarity* (Augsburg and Henry).

results had initially suggested that the community of Moosonee and the adjacent radar base were “two solitudes.” However interviews and archival data provided a clearer picture of the impacts of the radar base and of the employment and recreational opportunities that it created for local people. An interdisciplinary approach helped broaden this picture by showing how impacts differed depending on the gender, race, and class of individual residents.

Joe Moran has written that “interdisciplinarity is always transformative in some way, producing new forms of knowledge in its engagement with discrete disciplines.”¹ My research integrated data and concepts from fields such as Gender Studies and Land Use Planning in order to better understand the impact of the Cold War on Moosonee.² Gender Studies examines the relationships between men and women, and within groups of men and women. Further it assists with an understanding of community power structures. Joan Wallach Scott wrote that gender was ultimately about power and that “a scholarly understanding (of) the inequalities of power was organized along at least three axes (gender, race and class).”³ Joy Parr echoed this layered approach when she stated “In important ways, the experience of women was not like the experience of men, the experience of first nations was not like the experience of colonizers (and) the experience of workers was not like that of bosses.”⁴ Because of the complexities of Moosonee during the Cold War, it is useful to examine the differences in the experiences of women and men who resided in Moosonee and those who arrived to populate the local RCAF radar base. It is also

¹ Moran, *Interdisciplinarity*, 15.

² Both Klein and Chandler refer to Gender Studies as an interdisciplinary field. See Klein, *Humanities*, 77 and Chandler, 737.

³ Joan W. Scott, “Gender: A Useful Category of Historical Analysis,” *American Historical Review* 91, no. 5 (1986): 30.

⁴ Joy Parr, “Gender History and Historical Practice,” *Canadian Historical Review* 76, no. 3 (1995): 363.

important to examine community power structures which existed during the Cold War.

Like Gender Studies, Land Use Planning examines relationships, but the focus tends to be on land-based interaction. Jill Grant, the Director of the School of Planning at Dalhousie University, states that Planning looks at the connections between “key elements,” such as:

- people, physical objects, and ecological processes;
- problems, subject matters, and specializations;
- jurisdictions (federal, provincial, regional, and municipal); [and]
- domains (social, economic, political, and physical).¹

Allen Repko writes that land use problems are “highly appropriate for interdisciplinary inquiry and require drawing on insights from multiple disciplines to fully understand them.”² He cites Mathews and Jones’ work on systems theory and land use planning where these authors state that:

Problems associated with land use change include water-quality degradation created from developed landscapes, rising property values that lead to a lack of affordable housing, loss of aesthetic beauty ...and the uncertainties associated with new people, jobs, and ways of life invading an area.³

¹ Jill Grant, “Planning Canadian Communities,” In *A Reader in Canadian Planning: Linking Theory and Practice* ed. Jill Grant, (Toronto: Nelson Publishing, 2008), 9.

² Repko, *Interdisciplinary Research*, 154. Planning is sometimes described as “urban studies” or as part of Environmental Studies. Augsburg and Henry use both urban studies and Environmental Studies as examples of “content-based” interdisciplinary programs (9).

³ L. G. Mathews and A. Jones, “Using Systems Thinking to Improve Interdisciplinary Learning Outcomes,” *Issues in Integrative Studies* 26 (2008): 75 quoted in Repko, *Interdisciplinary Research*, 154. Underline mine. The choice of the word “invading” is appropriate for research which looks at military intervention in a community. However, it is startling to see this term in an example that is only intended to relate to “everyday” land use planning.

While using Land Use Planning methods to assess and map how the physical structure of Moosonee changed during the Cold War, my research also looks at federal, provincial and local (quasi-municipal) jurisdictions that functioned ‘above’ and within Moosonee. Gender Studies therefore primarily assists with examining “personal experience” in the community, and Planning helps to sketch the “community experience,” that is the way the town’s entire landscape and infrastructure changed as it was impacted by military activity. Kathryn Shailer writes that one of the benefits of Interdisciplinarity is that it involves the “Synergy of multiple perspectives and discipline-specific methodologies in addressing major social and political issues.”¹ The combination of Gender Studies and Planning enhances my research because this approach links disciplinary perspectives, thus having the potential for the “synergy of multiple perspectives” observed by Shailer.

One of the key steps in interdisciplinary research is the production of a literature review of relevant disciplines.² The initial literature search for research on Moosonee followed this approach by examining six key thematic areas or perspectives: The Canadian North, The Cold War, Radar Bases, Gender Studies, Indigenous Peoples, and Land Use Planning. The literature review also included any material specific to the town of Moosonee. Thematic areas were not constructed to limit the range of disciplinary material reviewed. Rather these thematic groupings were intended to ensure a broad examination of material that could provide perspectives on the question of the Cold War and Moosonee. Even though Repko, and others, suggested the early identification of “relevant” disciplines it seemed counter-productive

¹ Shailer, “Interdisciplinarity”, 6. (Note: Synergy is generally understood as an interaction of two things/objects to produce more than the sum of the individual parts).

² See earlier discussion in this paper of the steps proposed by Klein, Newell, Szostak and Repko and the step for selecting relevant disciplines, that is, disciplines that make sense for solving individual research problems.

(and not in the spirit of interdisciplinarity) to limit the range of literatures sourced, at too early a stage. For example, the literature on the Canadian North, crosses a number of key disciplinary boundaries (history, geography, economics, land use planning, sociology, indigenous studies, anthropology, and political science) and deals with a broad range of issues such as sovereignty, resource development and the impact of military activity. A narrower definition of “Canadian North” might have meant a focus on history and geography and could have excluded, for example, anthropology. This would have meant that key documents by anthropologists, concerning their observations on northern Cold War hamlets, would have been missed. As another example of the interdisciplinary base for research, the broad literature review assists with a comprehensive integration of insights on both personal relationships and power in Cold War Moosonee.¹

Interdisciplinary research can also facilitate the examination of how communities change over time, and how localities respond to stressors like mega-projects (e.g. radar bases, hydro dams, opening of new mines/industries). The impacts of change are not limited to one field of research and therefore the assessment of such impacts needs to be examined from a variety of stances. Mannell and Ternoway used interdisciplinary language in their discussion of Land Use Planning when they stated that “daily life is not constrained by departmental boundaries” and that a true understanding of a community requires “weaving separate parts together.”² The “separate parts” that these planners referred to were the environment, infrastructure, local government, housing, and socio-economic aspects of a community.

¹ As noted earlier in this paper, “integration of disciplines” Klein (“Taxonomy”, 16-17) and “integration of insights” (Repko, “Disciplining”, throughout) are essential to interdisciplinary work.

² Laura Mannell and Heather Ternoway, “The Need to Do More: Advancing Planning with First Nations Communities,” *Plan Canada* 48, no. 2 (2008) 22.

Recent work by Distant Early Warning Line (DEW) researchers suggests that “an interdisciplinary survey of the (DEW) Line ... and (its) wider Arctic contexts is long overdue.”¹ The literature review for research on Moosonee showed that neither an interdisciplinary survey, nor any comprehensive analysis, existed for Pinetree radar bases, like Moosonee. Research on Moosonee benefits from an interdisciplinary approach because it places the town in its Cold War context and it meshes the “separate parts” noted by Mannell and Ternoway within the axes of gender and power described by Joan Scott and Joy Parr.

The study of Moosonee and the Cold War will not be ‘instrumental’ in that it will not solve a specific problem for the community, but it will add to our knowledge about how small northern communities adapt to adjacent development. Furthermore, research on Moosonee will add to our understanding of what makes a better community, that is, a community based on quality of life, adequate services, and positive personal experiences. Such an understanding could inform research not only on new towns but also on existing communities, particularly in northern Ontario as we approach the ‘Ring of Fire’ era.²

¹ P. Whitney Lackenbauer et al, *The Distant Early Warning Line: A Bibliography and Documentary Resource List*, (Arctic Institute of North America, 2005), 2.

² The ‘Ring of Fire’ is a huge mining development north of Longlac, Ontario (and west of Attawapiskat). Some researchers are already discussing the potential for the construction of a new resource town in this area. The potential for a new settlement and the anticipated impacts on existing indigenous communities, were discussion points at a Ring of Fire symposium held at Laurentian in February, 2012.

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Appendix One: A Selection of Interdisciplinary Authors

Interdisciplinary Author	Background	Text or “Article”(see Bibliography for full details)
Sally Aboelela	Research Associate in the Centre for Interdisciplinary Research on Antimicrobial Resistance (CIRAR) and Asst. Professor of Physiology, Columbia University School of Nursing (New York)	“Defining Interdisciplinary Research”
Caroline Andrew	Chaired Political Science Dept. at U. of Ottawa	Paper in <i>Outside the Lines</i>
Tanya Augsburg	Assistant Professor of Liberal Studies (Creative Arts and Humanities at San Francisco State University	Co-edited <i>Politics of Interdisciplinary Studies</i> (2009)
Thomas Benson	Philosophy Professor at University of Maryland for 15 years, then President of Green Mountain College (Vermont) from 1994 to 2002. President of the Association of Integrative Studies: 1984-85.	“Five Arguments Against Interdisciplinarity Studies” in Newell.
Guy Berger	Dépt. of Education Sciences, Université de Paris VIII (Vincennes)	Co-author, <i>Universities and the Community</i> (OECD, 1982)
James Chandler	Director, Franke Institute for the Humanities (U. of Chicago)	“Introduction: Doctrines, Disciplines...”
Angelique Chettiparamb	PhD in Complexity Theory and Planning from Cardiff U. in 2005, Research Fellow in School of City and Regional Planning, Cardiff University (Wales)	“Interdisciplinarity: A Literature Review”
Pierre Duguet	Specialist in Education and New Information Technologies, Centre for Educational Research & Innovation (CERI) in Paris.	Co-author, <i>Universities and the Community</i> (OECD, 1982)

Clifford Geertz	Professor of Social Science, Institute for Advanced Study, Princeton.	“Blurred Genres” in Newell
Alison Hearn	Associate Professor in the Faculty of Information & Media Studies at University of Western Ontario	Co-Editor of <i>Outside the Lines</i> (1996)
Stuart Henry	Director of the Interdisciplinary Studies Program at University of Texas (Arlington), Former Director of School of Public Affairs at San Diego University. Served for 7 years as Chair of the Dept. of Interdisciplinary Studies at Wayne State U. (Detroit)	Co-edited <i>Politics of Interdisciplinary Studies</i> (2009)
Theodore Hershberg	Professor of Public Policy and History, and Director of Centre for Greater Philadelphia, University of Philadelphia.	“Fragmentation of Knowledge” in Newell.
Julie Thompson Klein	Professor of Humanities at Wayne State University (Detroit).	Co-Editor of <i>Oxford Handbook of Interdisciplinarity</i> (2010); Author of <i>Crossing Boundaries</i> (1996) and <i>Humanities, Culture & Interdisciplinarity</i> (2005)
J. Linn Mackey	Professor in Dept. of Interdisciplinary Studies at Appalachian U. (North Carolina)	“Rules are Not the Way...”
Karen Messing	Professor (adjunct/retired) of Biological Sciences at University of Quebec (Montreal)	<i>Article in Outside the Lines</i>
W. J. T. Mitchell	Professor of Art and English at University of Chicago. Interests include Iconology (the general study of images across the media).	“Interdisciplinarity and Visual Culture”
Joe Moran	Professor in Cultural History and English at Liverpool John Moores University (School of Humanities and Social Sciences)	Author of <i>Interdisciplinarity</i> (2002, 2 nd ed 2010).

Edgar Morin	French philosopher, authored over 30 texts and numerous articles on complexity, science and philosophy between 1951 and 2011.	Author of <i>On Complexity</i>
William Newell	Professor of Interdisciplinary Studies at Miami University of Ohio from 1995 to 2010. Has published more than 30 articles and chapters on interdisciplinary studies. Founding member of the Association of Integrative Studies (1979).	Editor, <i>Interdisciplinarity: Essays from the Literature</i> (1998)
Svetlana Nikitina	Research Specialist, Harvard Graduate School of Education and later Assistant Professor and Co-coordinator of Interdisciplinary First Year Humanities at Worcester Polytechnic Institute (Mass.)	“Navigating the Disciplinary Fault Lines”
Allen Repko	Author of one of the first textbooks for undergraduate and graduate interdisciplinary students. Former Director of the Interdisciplinary Studies Program, School of Urban and Public Affairs, U. of Texas at Arlington	Author “Interdisciplinary Research: Process & Theory” (2008/2012)
John Robinson	Professor in Department of Environment and Resource Studies, University of Waterloo, from 1981 to 1992. Since 1992, Director of the Sustainable Development Research Institute at UBC.	Article in <i>Outside the Lines</i> .
Liora Salter	Cross-appointed, Faculty of Environmental Studies at York U. and Osgoode Hall Law School since 1990.	Co-Editor of <i>Outside the Lines</i> (1996)

Kathryn Shailer	Professor at the Ontario College of Art and Design (since 2003). Received her PhD from Princeton in 1978 (in Germanic languages and literature).	“Interdisciplinarity in a Disciplinary Universe”
Marilyn Strathern	Professor in the Dept. of Social Anthropology, University of Cambridge.	Author, <i>Commons and Borderlands</i>
Rick Szostak	Author of 9 books and numerous articles on interdisciplinary research. Professor of Economics at U. of Alberta (Edmonton) since 1985. Developed the Office of Interdisciplinary Studies at U. of A.	“How to do Interdisciplinarity...”
Jill Vickers	Director of the Institute of Canadian Studies at Carleton University.	Article in <i>Outside the Lines</i> .
Peter Weingart	Professor emeritus of Sociology of Science and Science Policy at the University of Bielefeld, Germany. Director of the ZiF (Centre for Interdisciplinary Research) from 1989 to 1994.	Co-Editor, <i>Practising Interdisciplinarity</i>