

Building Student Research Capacity: Faculty Perceptions about Institutional Barriers in Canadian Universities

Laura Ryser and Greg Halseth
University of Northern British Columbia

ABSTRACT

As part of a long tradition, university faculty have been incorporating students into their work to meet the increasing demands for collaborative research. However, some educational institutions in Canada lack appropriate policies and infrastructure to support the pedagogical aspects of student research training and development. Drawing upon experiences with the New Rural Economy project, we explore faculty perceptions of institutional barriers to building student research capacity through a Canadian multi-university research project. Findings indicate that pressures associated with tenure and promotion, and the unintended consequences of policies that guide research operations, do not support student research training and development during a student's period of enrollment or during transition periods between their research degrees. Faculty also perceive limited mechanisms for sharing resources across educational institutions to facilitate student research engagement across multiple universities.

INTRODUCTION

In Canada, federal funding agencies are increasingly allocating resources to collaborative research (Gilroy, 2005) to tackle complex problems that require multiple sources of expertise, research approaches, and labor beyond what is available through individual researchers (Repko,

2008). As collaborative research becomes increasingly common, it is important to prepare students, our next generation of researchers, to engage in this more complex setting by providing them with a broad range of research experiences. However, it has been suggested that there is a lack of appropriate policies, infrastructure, and other institutional supports to enable faculty to appropriately train this next generation of researchers (Council of Ontario Universities, 2004).

Drawing upon experiences from the New Rural Economy (NRE) project, this paper explores institutional barriers that faculty confront as they work to build student research capacity and involvement at both the graduate and undergraduate levels. It begins by briefly exploring previous work on institutional constraints impacting student research pedagogy. Following a review of the methodology used for this study, we describe faculty experiences with institutional barriers that impact student research pedagogy across a multi-university, interdisciplinary research project. Despite a focus upon the experiences of faculty engaged in one project, many of the identified challenges could be more broadly applied to other types of research projects. As this study is exploratory, issues at each university, and across different types of universities, are likely to vary, and further investigation is needed to explore the extent to which the issues raised here are unique to collaborative or to rural research, or work themselves out in different academic environments.

INSTITUTIONAL CONSTRAINTS TO STUDENT RESEARCH TRAINING AND PARTICIPATION

With our focus upon multi-university research teams, we review previous work concerning a range of institutional factors that may have unintended consequences for collaborative research. This provides an important foundation for exploring how institutional policies, infrastructure, availability of personnel, and competing demands can impact the ways in which faculty provide student research training and development opportunities.

Policies, both explicit and hidden, can produce disincentives to pursue collaborative research. Universities in Canada, for example, are ranked in part by the number of research grants obtained by faculty. Benefits allocated by national funding agencies (for example: 'institutional grants' and the number of Canada Research Chairs the university may hold) are based upon national granting council success. Through contemporary approaches to allocating funding, faculty are encouraged to obtain resources, space, and funding for their school or department (Larson, 2003). These competitive undertones may discourage faculty from pursuing research collaborations that take more time and effort to develop.

The emergence of collaborative, interdisciplinary research teams is also challenged by traditional academic department structures that may not reward collaborative research, co-authored publications, or contributions outside of traditional disciplines as a part of the tenure and promotion process (Robinson, 1996). Further, little emphasis may be placed on the process of training students, especially undergraduate students, in a broad range of research skills and experiences (McCormack, 2004; De Weert, 2001). Obtaining research grants at some universities or in some departments (perhaps described as 'primarily undergraduate' or 'teaching institutions')¹ may also not be viewed as a critical aspect for tenure and promotion (Miner, Miner, & Griffith, 2003).

Halpain, Jeste, Trinidad, Wetherell, and Lebowitz (2005) found that the provision of early intensive research experiences can attract students into an academic career. Yet faculty across

institutions and departments may have very disparate teaching and service loads that can impact the time available to engage in collaborative research, research training, and student mentoring (Lindsay, Breen, & Jenkins, 2002). Academic teaching commitments typically leave only summer months for faculty and their students to focus on research (Panelli & Welch, 2005). Collaborative research can also expand faculty workloads with additional time required for interaction, dialogue, and coordination (Lattuca, 2001), while student training and mentoring can be more difficult when disciplines bring very different norms and expectations. To enable faculty to execute student training and research, universities may have policies in place to reduce teaching commitments or ensure faculty are scheduled with the same annual courses so as to alleviate teaching preparation time (Miner, Miner, & Griffith, 2003).

Universities and funding agencies may impose deadlines and performance schedules that do not dovetail well with teaching commitments and may intensify time restraints on faculty. Although there have been positive changes in Canada, granting adjudication committees have typically not been comprised of those with interdisciplinary research experience or interests (Wekerle, 1996). With the involvement of numerous universities, cross-university research teams must apply to many research ethics boards, each of which may have different forms, deadlines, timelines, processes, and requirements.

Through their respective 'offices of research', however, universities can provide logistical support to faculty to help them understand internal and external funding processes and expectations (Conn, Porter, McDaniel, Rantz, & Maas, 2005). Other departments, such as administration, libraries, or computing services, can provide mechanisms supporting the incorporation of students into research projects (Laughlin & Sigerstad, 1990; Lowry & Hansen, 2001). For example, Lau and Hayward (2000) explored the use of virtual networks in research training programs. Sufficient provision of laptops, software, Internet access, and technical support was important to broaden access to resources, and engage members in collaboration and problem-solving activities. Human resource offices have policies that establish the hiring mechanisms, classification, pay rates, and benefits afforded to students and other research staff. Together with finance offices, they also coordinate formal agreements needed to govern the distribution, monitoring, and reporting of research monies among team members (and participating institutions) over a project's duration.

The allocation of human and financial resources for research support may indicate the level of a university's commitment to research (Connelly, 1997). Unfortunately, research supports are unevenly available across university types and sizes (Davis, 1988). Klein (1990) noted that smaller universities tend to have more limited funding sources, part-time research involvement, and a small number of disciplines. With centralized monitoring and review of projects, larger universities often offer better administrative support for collaborative and cross-university research work. Lattuca (2001) and Robinson (1996) cautioned, however, that administrative and departmental philosophy, rather than institutional size, is more likely a key determinant in successful collaborative research. Even if universities have developed research support, administrative staff may not have formal responsibilities for supporting or understanding of how to support students in research projects (Hinck & Brandell, 2000).

Despite efforts to explore institutional support of, and constraints on, research, few studies have examined institutional policies and contexts that may impact pedagogical aspects of student research training. Drawing upon the NRE project, we explore faculty experiences with

institutional barriers to building student research capacity in a multi-university, interdisciplinary research project.

METHODOLOGY

The research reported in this paper was conducted through the Canadian Rural Revitalization Foundation (CRRF) by members of its NRE team. The CRRF links rural residents, decision makers, businesses, service providers, and voluntary groups with researchers and policy makers to address challenges and opportunities associated with the new rural economy and to disseminate information in support of rural revitalization in Canada. The NRE (nre.concordia.ca) was created by CRRF to explore local capacity building in 32 sites across rural and small town Canada (Reimer, 2002).

The NRE is an *interdisciplinary*, multi-university research project which drew together researchers working with a common “conceptual framework to synthesize two or more disciplinary approaches” (Graybill, Dooling, Shandas, Withey, Greve, & Simon, 2006, p. 757), with a common methodological approach, share of research responsibilities, and activities to facilitate group interaction and the generation of ideas (Qin, Lancaster, & Allan, 1997). Utilizing researchers from many disciplines, the goal of the research was to obtain a greater understanding of the complex ways in which small communities are responding to change. The NRE project is structured into five Research Centers (aligned with the topics of Governance, Environment, Services, Communications, and Integration) that control research resources and manage research activities. The Research Partners work with the Research Centers in developing and executing research activities, but they are mainly responsible for deploying students to collect data and maintain relationships with residents in study sites located within their region. The project was funded by the Social Sciences and Humanities Research Council’s (SSHRC) “Initiative on the New Economy” program.

Prior to our research for this paper, the NRE had been engaged in research activities for seven years. Large-scale, national interdisciplinary research projects in the social sciences have not been common in Canada. Our experiences with a multi-university collaborative project motivated us to document faculty experiences that may inform future policy and research. While the literature has documented various general obstacles to student research pedagogy (Lattuca, 2001), less is known about the complications that multi-institutional contexts may have on the training and development of our next generation of researchers. Using an exploratory, qualitative methodology, we sought to understand how different institutional contexts affect the pedagogy of student research training.

The NRE has involved 19 faculty and 101 students from 14 universities across Canada between 1998 and 2005 (Figure 1). Faculty and students bring expertise and knowledge from a range of disciplines, including sociology, geography, gender studies, economics, anthropology, environmental studies, rural development, forestry, and resource management. This paper draws upon in-depth interviews conducted with the 11 faculty members in the NRE (Table 1). The sample includes faculty of different genders, from both Research Centers and Research Partners, and from both primarily undergraduate and comprehensive universities. To develop recommendations for building student research capacity, open-ended questions were used to explore institutional constraints/supports. Faculty were asked to describe their access to potential student researchers, strategies used to recruit students both within and outside of the university, how students were connected with various NRE projects across the country, any institutional

constraints that impacted student participation, and about any faculty initiatives or opportunities afforded by universities to incorporate students into the NRE project. These open-ended research questions were informed from the literature and the personal experiences of the authoring research team.

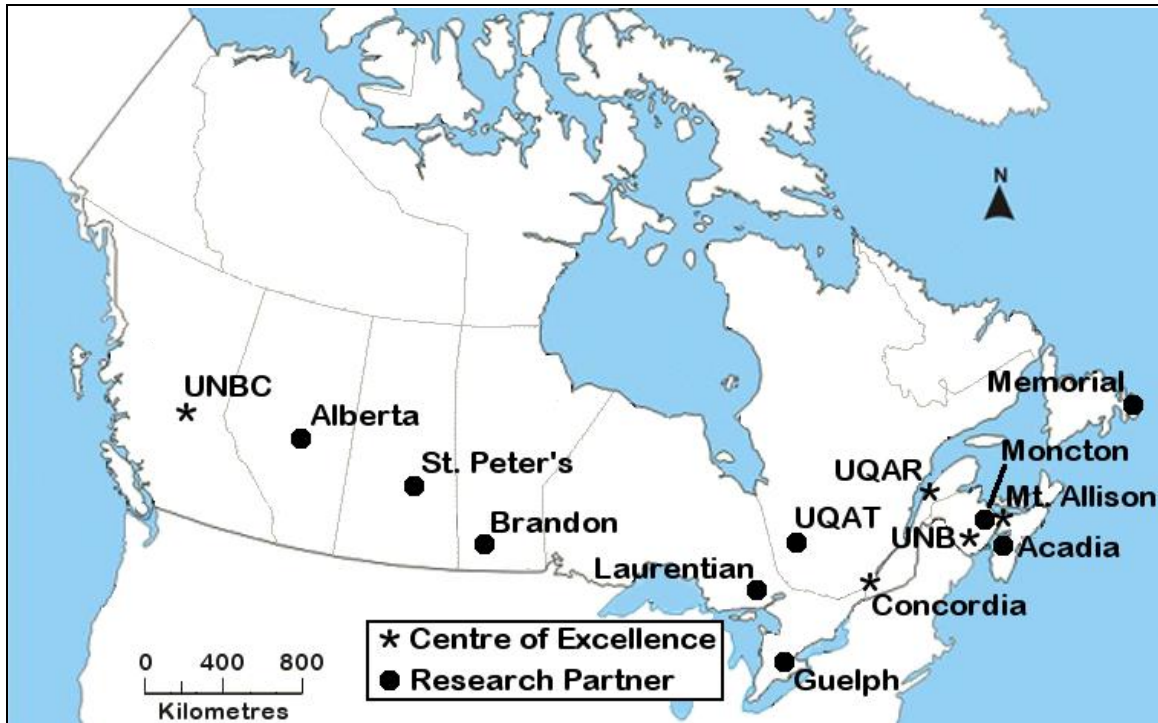


Figure 1. Canadian Universities Involved in the NRE Project

Note: Map abbreviations are: UNBC (University of Northern British Columbia), UQAR (Université du Québec à Rimouski), UQAT (Université du Québec en Abitibi-Témiscamingue), and UNB (University of New Brunswick).

Table 1. Characteristics of Faculty Involved with the New Rural Economy Project

Research Center or Research Partner	Type of University	Gender of Faculty	Students' Level of Study	Expertise
Research Center	Comprehensive	Male	3 Ph.D. students 19 M.A. 7 B.A.	Sociology, Anthropology
Research Center	Primarily undergraduate	Male	3 Ph.D. students 2 M.A. 1 B.A.	Sociology
Research Center	Comprehensive	Male	2 Ph.D. students 3 M.A. 2 B.A.	Sociology, Forestry, Resource Management
Research Center	Primarily undergraduate	Male	7 B.A.	Geography
Research Partner	Primarily undergraduate	Male	2 M.A. 1 B.A.	Geography, Rural Studies
Research Partner	Primarily undergraduate	Male	2 M.A. 3 B.A.	Sociology
Research Partner	Comprehensive	Female	3 Ph.D. students 4 M.A.	Planning, Rural Development
Research Partner	Primarily undergraduate	Male	2 M.A. 2 B.A.	Sociology
Research Partner	Primarily undergraduate	Female	1 M.A.	Sociology
Research Partner	Primarily undergraduate	Male	2 M.A. 3 B.A.	Sociology, Environmental Studies
Research Partner	Comprehensive	Male	6 B.A.	Sociology

Notes:

Ph.D. = doctoral student; M.A. = Master's student; B.A. = Bachelor's student

Classification of university 'type' is derived from a Canadian discourse popularized by the *MacLean's* magazine (<http://oncampus.macleans.ca/education/2008/12/19/our-18th-annual-rankings/>) and its annual ranking of academic institutions. Primarily Undergraduate universities focus on undergraduate education and have few graduate programs. Comprehensive universities have significant research programs and a wide range of undergraduate and graduate programs.

Faculty interviews were conducted by research assistants from the University of Northern British Columbia. Interviews were transcribed verbatim for analysis. Using both manifest and latent content analysis, responses from open-ended questions were then coded and categorized into themes (Babbie, 2004). Manifest content analysis describes specific words that are written or used, while latent content analysis explores a deeper or intended meaning. This entailed three rounds of coding conducted by two research assistants who were not involved in the interviews and who could bring a greater open-mindedness to emerging themes. Each round of coding was also reviewed by the lead faculty researcher. In the first round, research assistants brainstormed key words and themes from an initial reading of the transcripts (Bailey, White, & Pain, 1999). These keywords provided the basis for manifest content analysis (Dunn, 2005). Themes identified from previous studies (i.e., policy challenges, lack of infrastructure, and competing demands on faculty) provided a basis for the latent content analysis (Robinson, 1998). The second round of manifest and latent content analysis entailed checking the occurrence of keywords or themes, revising accordingly by adding or collapsing categories, and developing a hierarchy of terms and themes. This includes identifying relationships between keywords and themes of similar meaning. For example, faculty concerns about “rules”, “regulations”, and “policies” were grouped under the theme “policy challenges”. The final round focused on latent content analysis. In addition to rechecking, it provided another round for testing the broader categories and themes within those categories. Triangulation was used to compare responses between participants and with previous literature to improve validity (Hycner, 1999).

RESULTS

Exploring faculty perceptions of institutional constraints that limit student research training through an interdisciplinary project can produce important recommendations concerning institutional operations and policies. Through interviews, faculty outlined five themes concerning institutional constraints: access to student researchers; the design of programs and research institutes; competing teaching, service, and research responsibilities; policy challenges; and financial challenges.

Access to Student Researchers

Given that many of the participating universities in the NRE project are small and primarily undergraduate, faculty are challenged to execute research due to limited access to potential student researchers (Table 2). Some universities do not have graduate or Ph.D. programs, and even where such exist, institution size may limit the numbers of graduate students. While other Canadian research projects, such as Metropolis, have larger participating universities and a greater proportion of Ph.D. and post-doctorate students, participating universities also report considerable differences with access to student researchers at the undergraduate, graduate, doctorate, and post-doctorate levels (CERIS, 2010; Lamba, Maximova, Mulder, & Shankar, 2002; Pendakur & Yan, 2009). Access to sufficient graduate students provided some faculty with greater stability and continuity over the course of the NRE project. Such stability also affords students a greater range and duration of research experiences (Ryser, Halseth, & Thien, 2009). Length of research terms has been linked to successful student recruitment (Seymour, Hunter, Laursen, & Deantoni, 2004).

Table 2. Institutional Barriers to Building Student Research Capacity

Limited Access to Student Researchers

Limited access to graduate students
Competition to recruit and retain student researchers
Other jobs
Volunteer commitments
Lack of interest in research
Lack of interest in rural issues
Lack of experience/expertise amongst students

Design of Programs and Research Institutes

Limited courses covering rural topics
Limited graduate programs
Limited promotion of research units
Limited visibility of research projects

Competing Teaching, Service Commitments, and Research Responsibilities

Heavy course loads
Limited administrative support for teaching and research activities
Changing work schedules due to changing mix of contracts and teaching responsibilities
Lack of time—faculty
Emphasis on products rather than training students
Lack of evaluation mechanisms
Difficulty sustaining research activities to support research contracts

Policy Challenges

Government funding agencies do not recognize students in transition periods
University regulations prevent faculty from hiring graduating students
Government funding agency policies are geared towards larger university models
University caps regulate the number of hours that students can work
University regulations restrict the rate of pay for students
University procedures do not allow advances to cover field work expenses

Financial Challenges

Lack of funding for student training and development
Cumbersome procedures for invoices covering student expenses and research activities in an interdisciplinary project

Source: INE Faculty Interviews

Limited institutional support for students through mechanisms that include research assistantships contributes to an underdeveloped culture of seeking employment and training through university research projects. With a limited pool of student researcher candidates, there is further competition to recruit and retain the best students due to other employment/volunteer commitments (Panelli & Welch, 2005). As a result, fewer students than expected applied for

research assistant positions. As one faculty member noted, “You don’t have 5 people applying for a position. You’re lucky if you get one” (ID#5).

In the NRE project, faculty at times experienced problems carrying out research due to the mixed quality and experience of students. For example, some faculty felt that few students had quantitative research skills—something exacerbated by the lack of methods courses among undergraduate and graduate curricula at some universities. The focus seemed to be on hiring independent students already equipped with research capabilities so that they make efficient contributions rather than using the research process to train new researchers. As depicted by one faculty participant, “if we didn’t have high quality and go getter students, I could not be a part of the project. It’s just too difficult” (ID#6). This orientation is grounded in pressures faced by faculty to produce publications for tenure and promotion. Unfortunately, many funding programs (or the evaluators assigned to review applications under those funding programs) and those on university tenure/promotion/merit committees still do not accord enough consideration to the time, support, and ultimate long-term benefits of faculty investing in the training and mentoring of new researchers.

In response to limited access to student researchers, faculty have ‘shared’ students. In the NRE project, there were cases in which graduate students from larger universities have conducted research with faculty at smaller institutions. Under such circumstances, cooperating faculty members share responsibility for student research pedagogy, and can broaden student exposure to different research approaches. Faculty have also used a variety of recruitment strategies, including through courses taught, orientation talks to incoming graduate students, word-of-mouth and referrals from other faculty and students, job advertisements, and general publicity and media stories about the project.

Design of Programs and Research Institutes

The development of programs and research institutes can also facilitate or constrain opportunities for building student research capacity (Porter, 2006). Given that most universities in Canada are located in urban centers, there is a structural challenge for the NRE that can make it difficult to convince urban-based students that rural research matters. This problem is exacerbated by the absence of rural development programs that could otherwise be a natural source of potential student researchers. As one faculty member explained, “We don’t have any program in local development or rural studies. Those programs don’t exist [here]. So it’s hard for me to find students who are interested in rural studies” (ID#10). Other rural-based research projects in Canada and Australia have expressed similar concerns about the impact that limited rural topic course offerings have had on the recruitment and development of rural health researchers (Kulig, Minore, & Stewart, 2004; Taylor, Hughes, Petkov, & Williams, 2005).

Institutions can capitalize on interdisciplinary research to create new teaching programs that might foster stronger linkages for student learning in both the academic and research settings (Klein, 1990). While previous work has suggested that student engagement may be impacted by university size (Porter, 2006), further research needs to explore linkages among university size, range of course/discipline offerings, and student interest and engagement in those same research topics.

In addition to the design of programs, departments, and curricula, institutional support for student research training now increasingly includes ‘research institutes’. Research institutes are one

mechanism by which universities are responding to increased calls for collaborative and interdisciplinary research while leaving in place their rather more archaic structure of discipline-based departments and administrative reporting structures. However, limited promotion, recognition, and support (financial and otherwise) of research institutes can limit their effectiveness in attracting/training student researchers. Where research institutes are in place, institutions can assist in making them more 'visible' to students, especially undergraduates, so that research training opportunities become a more common part of the student learning culture.

Competing Teaching, Service, and Research Responsibilities

Faculty identified several conflicting commitments associated with teaching, service, and research responsibilities that limited the time they could commit to training and mentoring students. Heavy course loads for teaching, especially at primarily undergraduate institutions, limit faculty's ability to engage in student research training (Lindsay, Breen, & Jenkins, 2002). The increasing emphasis at Canadian universities to be 'research intensive' has not fit well with pre-existing university teaching and service duties. Senior administrators use research funding dollars as promotional points for their institutions, but the delivery of those dollars and the work needed to carry out the research has been 'added' to faculty who were already 'fully employed'. While some universities support research funding success by working to reduce teaching loads, this is not universal. In Canada, funding agencies such as SSHRC have even reduced opportunities for research time stipends² (funds to 'buy out' faculty teaching) within many of their research grant programs. This contrasts to policies in the United States where researchers benefit from a broader range of federal programs, such as the American Recovery and Reinvestment Act (ARRA), federal agencies, such as the National Science Foundation and the National Institutes of Health, and foundations such as the Smith Richardson Foundation, that provide grants to buy-out teaching time of faculty engaged in research grant work (Gibson, 2010; National Institutes of Health, 2003; National Science Foundation, 2009; Smith Richardson Foundation, 2010).

Limited baseline financial support from institutions for research projects means that faculty are busy pursuing a mixture of teaching, contract work, and research. The constantly changing nature and demands of research activities, faculty teaching schedules, and student commitments impact the time available to create opportunities for training and mentoring the next generation of researchers. These challenges are compounded by the start dates, end dates, and reporting requirements of funding agencies.

As some faculty experience time constraints, it also becomes apparent that some students are not benefiting from a formal evaluation process to facilitate their research learning process. As one faculty member said, "We don't have any form of formal evaluation of our student mentoring activities" (ID#8). Evaluation processes are important ways by which institutions communicate expectations (McCormack, 2004), and limited monitoring and evaluation of student research training through the research process can have serious consequences for both the student and the research.

Within this multi-university collaboration, there are uneven time and supports among faculty to participate in student research training. The ability to engage in ongoing mentoring activities can be further complicated by the distance and isolation that can exist among participating institutions. When asked if and how students were provided with opportunities to interact with faculty and students at other universities, faculty described how much easier it was to interact with researchers at the same institution. While frequent engagement between colleagues and

students is critical to building interdisciplinary knowledge and collaborative research skills, typical opportunities for interaction (even with new information technologies) are not easily transferred to multi-university research. This is important as faculty and students may disengage from future multi-university research collaborations due to such comparably more challenging circumstances.

Additional problems that may limit student researcher retention include securing enough funding to pay students a 'living wage'. Research projects and contracts often have periods of intense work, such as when field work is conducted, and these periods typically require large numbers of student assistants. At other periods, there may be fewer demands for student assistance. Sporadic work (and resulting pay) may not provide enough stability to attract and retain potential student researchers in a competitive job market.

Finally, there are disconnects between teaching and research. As articulated by one faculty participant:

The endeavor is very, very unrelated to what I teach at the undergrad level. I'm quite interested in it with my background and training, but I have this real disconnect between my undergrad experience in teaching and what I do with the graduate work (ID#11).

Some faculty have been successful in incorporating research into the undergraduate experience through the provision of directed or independent studies courses. Undergraduate students enrolled in special topics or directed studies courses would use NRE data and gain research experience, while both faculty and students would benefit from the academic products. Such courses also provide a tool by which faculty can test the quality of students who may later be hired as researchers. Institutional flexibility and responsiveness in allowing for the rapid development and delivery of special topics courses was shown through the NRE project as important in enhancing student interest and research training.

Policy Challenges

Faculty identified several policy constraints that affect their efforts to build student researcher capacity. Such institutional policy challenges were identified within funding agencies and within universities.

Given that the NRE project was supported by SSHRC funding, faculty noted how SSHRC policies sent mixed messages about the use of research funds towards experiential learning and capacity-building among new researchers. These mixed messages revolved around faculty perceptions of the words 'students' and 'new researchers', and the larger goal of helping students bridge their current academic careers with the future they hope to pursue. The problem is highlighted by one faculty member:

Often, SSHRC wants us to hire students; but we're often in a case, like with [student X], where he was a student and then has graduated. We want to keep him on because he's got all sorts of talents and stuff, so he becomes part of the project. He was not a student, but I'm sure that the reason he's now a student again is because he's been working on the project. There's a kind of a hiatus role there that doesn't get recognized by SSHRC getting too adamant about us hiring students (ID#1).

If the goal is truly about training the next generation of researchers, then granting agency policies and practices must include broad language and programming to support that goal. At present, SSHRC does not have a program of undergraduate student summer research assistantship/internship grants to let undergraduates ‘test drive’ research work (even though their natural sciences counterpart in Canada and granting agencies in the United States provide such opportunities^{3,4}). Policies, practices, and language must also allow faculty to support undergraduate or graduate students who finish their degrees, but wish to continue conducting research for a short period of time before pursuing employment or a higher educational degree. Universities may also have policies that inadvertently prevent student researchers from working on research projects between their educational pursuits. For example, another faculty member indicated, “For students who are graduating, I couldn’t hire them under the university’s rules because they are ‘leaving’ the university” (ID#8).

Second, there was a perception that SSHRC (or the various project and peer evaluators identified by SSHRC) penalizes research projects for not having large numbers of doctoral or post-doctoral students engaged by the time of the project’s mid-term review. These expectations were felt to be based on larger university models that are not well suited to the participation of smaller, primarily undergraduate institutions. Given the increasing role of smaller universities in research and in developing student research capacity, the policies, practices, and language of support must be better aligned with the diversity of the Canadian university research landscape.

Within universities, there are also regulations or policies that limit (or manage) the amount of support graduate students may receive. For example, it was suggested that receiving a research assistant position may impact a student’s chance to receive additional university support. As one faculty member explained:

We can’t pay them for the first year and a half because they might not be able to get their GTA (Graduate Teaching Assistantship)... The GTA has regulations for how much you can work, and you have to negotiate things above that (ID#4).

This challenge also speaks to the sometimes conflicting and sometimes complementary tasks to be achieved through graduate student training. Graduate teaching assistantships provide a wonderful opportunity for students to gain teaching and classroom experience, while research funding support allows them the opportunity to build skills that also contribute to their career development. The ‘balancing act’ that many departments and universities undertake to ensure that as many graduate students as possible are supported through their studies may inadvertently create disincentives for developing experience in each of these core capacity areas.

It was also suggested that university regulations may restrict the rate of pay afforded to students according to their level of study. For example, faculty told us that:

The only constraint is the rate, and the rate is fixed. The pay rate is \$12. For undergraduate students, it’s \$10. For graduate students, it’s \$12. I lost students because of that (ID#9).

Well I mean at XX University, we get our student assistant rates that come out every year, and we have to follow that. I despise that as well. It’s not their money. This is SSHRC money. If SSHRC doesn’t have a mandate on what a Master’s level student conducting primary fieldwork should get; if I want to pay a highly qualified and capable

student \$25 an hour, and that fits within SSHRC's rules, I should be able to do that (ID#6).

Policies that regulate student wage rates can also make it difficult to recruit and retain good student researchers who may be easily find other jobs that pay higher wages. This can become more complicated after a student graduates and wishes to work as a researcher for a year or two before continuing on to their next degree. Unable to call such people 'post-docs', the student often falls under new university hiring and pay rules (especially in circumstances with comprehensive staff union agreements).

Financial Challenges

Key financial challenges were identified with respect to the flow of funding used to support training and capacity building for student researchers. These challenges focus upon the question of funding 'certainty' and the 'paperwork trail' that may not align with research cycles or the challenges of working in a multi-university research project.

Some universities have internal funding programs that can 'bridge' student support between projects. In some cases, these programs extend to undergraduate students interested in research opportunities. Even with support through the NRE project, many faculty still spent considerable time piecing together different sources of money to employ and retain students throughout the year. Some faculty, for example, utilized federal government summer student employment programs to help fund student research positions. These brought their own institutional problems associated with changing policies and regulations concerning who could qualify. For example, policy changes one spring meant that universities no longer qualified for student summer employment programs. Following complaints, these rules were reversed early in the summer. Fluctuations in policies and procedures can create difficulties for supporting student learning experiences on a consistent basis.

With the execution of research tasks, in multiple sites, on behalf of project leaders located at different research institutions, there was a need to fill out numerous invoices for the NRE Research Centers that have control over project funding. These additional procedural requirements between universities can be cumbersome and time-consuming for faculty not trained in these tasks. Such additional procedural requirements may create disincentives for faculty to become involved in future collaborative research projects.

Finally, the integrated model of research used by the NRE project involving student researchers at various universities created challenges for faculty trying to hire students from other universities. This is because regulations at some universities stipulate that students can only be paid by their institution. In terms of supporting students to carry out summer field work, some faculty were unable to obtain advances from other universities to cover their student's expenses. As a result, there were times when faculty had to cover student field expenses out of their own bank account.

DISCUSSION

Despite the important role that students play in supporting research, the literature has paid limited attention to opportunities and constraints that institutional resources, infrastructure, policies, and procedures can have on pedagogical aspects of student research training. These factors can impact the type of research training and experiences afforded to students, and may ultimately impact if

and how students pursue graduate studies or future research employment. Drawing upon experiences with the NRE project, we explored faculty perceptions of institutional barriers to building student research capacity in Canadian universities.

With a focus on the Canadian research environment, our findings identify a range of institutional barriers related to limited access to student researchers; the design of programs and research institutes; competing teaching, service commitments, and research responsibilities; policies; and financial constraints that impact student participation. Each of these barriers has implications for project leaders, universities, and government funding agencies. Three items, in particular, can be highlighted.

First, the policies, actions, and pressures associated with tenure and promotion systems can direct faculty attention away from long-term investments in student research pedagogy in favor of short-term 'product' creation that can be linked directly to faculty career security. This becomes more complicated within an interdisciplinary or cross-university project in which faculty work under different norms and cultures with respect to the role, process, and supports for student training. Tenure and reward systems that value both collaborative research products and student research training should be developed.

Second, granting agencies and universities may also inadvertently put an emphasis on products rather than the process of training the next generation of researchers (Futures Task Force of the Council of Ontario Universities, n.d.). The gaps in funding support during a student's academic career, or during transition periods between degrees, highlight the need for attention to a continuum of support to attract and retain the best potential candidates as new researchers. While funding agencies call for research proposals to include student training and development, a critical need is for support during transition periods between undergraduate and graduate degrees, and between student programs and public/private sector careers. More general support for 'new researchers' during this transition will also pay dividends through peer mentoring of less experienced student research assistants. Funding agencies will also need to incorporate a broader view of university models in their evaluation processes to recognize the varying accessibility of graduate students across institutions. Similarly, universities should work with union organizations and research teams to draft policies that would permit these new researchers to continue to work for research projects during student transition periods.

Finally, attention needs to be directed at mechanisms for sharing resources across educational institutions to facilitate student engagement and mobility across multiple universities. As noted above, the absence of courses or graduate programs can impact faculty access to students with the interest, skills, and expertise to engage in research. While it may not be feasible to create courses or programs in every research topic area, universities could build upon institutional agreements for sharing students in needed topic areas. One of the NRE project's participating universities, the University of Northern British Columbia (UNBC), has this flexibility through a 'Western Dean's Agreement' allowing for greater student mobility for courses and research experiences in universities across western Canada without having to enroll at those other institutions. Such flexible support platforms for building student capacity can also facilitate the sharing of resources and the harmonization of policies across educational institutions. Internal university support should also enable faculty to allocate (and be rewarded for) more time towards the pedagogical aspects of student research training. Significant changes are taking place and this demonstrates that it is possible for institutions to reform their administrative structures to be flexible in

facilitating research support. Notably, inter-university financial transfers are becoming normalized and routinized.

In addition, other issues were raised with respect to institutional barriers to building student research capacity. For example, greater visibility is needed to promote opportunities for students to become involved in collaborative research. While research space provides visibility, there are also opportunities for the employees of the research project, communications office, and research office (Conn et al., 2005; Davis, 1988) to promote research visibility through newsletters, websites, signage, community and academic lectures, career fairs, and information sessions with students at the beginning of the academic year. To overcome sporadic recruitment methods, directory lists of staff willing to have undergraduate and graduate students assist with their research may further improve student recruitment. Long-term internal and external support must also be provided to support research institutes that function as a focal point or incubator of interdisciplinary research projects targeting strategic interests that would further provide stability and visibility to attract students.

This paper has drawn upon the faculty experiences of one interdisciplinary research project conducted on rural development topics across a number of Canadian universities. While some of the findings may be specific to cross-university projects, or to rural research, others speak more generally to the role of student research training. Further study could assess the capacity and institutional constraints of different types of institutions as they strive to develop the next generation of researchers. We know little about the type and quality of institutional support that students need, pursue, and receive. Future research could also explore the disconnection among government funding for research and faculty/student interests, how institutional support and constraints impact student decisions to pursue graduate studies or research careers, and successful strategies for recruiting new student researchers.

END NOTES

1. 'Primarily undergraduate' refers to institutions that have degree-granting status but do not offer (or offer a limited range of) graduate studies programs. For many of these institutions, internal and external measures of success focus upon numbers of students enrolled and graduated.
 2. Recent federal government funding cutbacks to SSHRC have put a number of programs, including research time stipends, in jeopardy.
 3. Recent federal government funding cutbacks to NSERC have meant that undergraduate internship programs will be terminated in 2011, although undergraduate student research awards and the Aboriginal Ambassador in the Natural Sciences and Engineering Supplement Program remain intact.
 4. In the United States, the National Science Foundation provides several research training programs for undergraduate students, such as Interdisciplinary Training for Undergraduates in Biological and Mathematical Sciences, Developing Global Scientists and Engineers (International Research Experiences for Students), and Research in Undergraduate Institutions (http://www.nsf.gov/funding/education.jsp?fund_type=1). Furthermore, in partnership with the Recovery Act, the National Institutes of Health is providing summer research opportunities for both high school and undergraduate students (<http://grants.nih.gov/grants/guide/notice-files/not-od-09-060.html>).
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LITERATURE CITED

- Babbie, E. (2004). *The practice of social research* (10th ed.). Los Angeles, CA: Wadsworth/Thomson Learning.
- Bailey, C., White, C., & Pain, R. (1999). Evaluating qualitative research: Dealing with the tension between 'science' and 'creativity'. *Area*, 31(2), 169–183.
- CERIS, The Ontario Metroplis Centre. (2010). *Metropolis Project phase III midterm review*. Toronto: University of Toronto. Available online at: www.ceris.metropolis.net.
- Conn, V., Porter, R., McDaniel, R., Rantz, M., & Maas, M. (2005). Building research productivity in an academic setting. *Nursing Outlook*, 53(5), 224–231.
- Connelly, L. (1997). Does external funding of academic research crowd out institutional support? *Journal of Public Economics*, 64(3), 389–406.
- Council of Ontario Universities. (2004). *A vision for excellence: COU response to the postsecondary review discussion paper*. Toronto: Council of Ontario Universities.
- Davis, S. (1988). Research administration at predominantly undergraduate institutions with a small volume of sponsored programs. *Research Management Review*, 2(2), 41–52.
- De Weert, E. (2001). Pressures and prospects facing the academic profession in the Netherlands. *Higher Education*, 41(1/2), 77–101.
- Dunn, K. (2005). Interviewing. In I. Hay (Ed), *Qualitative research methods in human geography* (pp. 79–105) (2nd ed.). Oxford: Oxford University Press.
- Futures Task Force of the Council of Ontario Universities. (n.d.). *University education in Ontario - Shared goals and shared building blocks*. Toronto: Council of Ontario Universities.
- Gibson, A. (2010). *Stimulus program pumps in \$7.1 million to date for faculty research, airport improvements*. Ohio University. Available online at: www.ohio.edu/research/communications/stimulus_june10.cfm.
- Gilroy, G. (2005). *Student training in SSHRC-funded research: Final report*. Prepared for the Social Sciences and Humanities Research Council of Canada. Ottawa: Goss Gilroy Inc. Management Consultants.
- Graybill, J., Dooling, S., Shandas, V., Withey, J., Greve, A., & Simon, G. (2006). A rough guide to interdisciplinarity: Graduate student perspectives. *BioScience*, 56(9), 757–763.
- Halpain, M., Jeste, D., Trinidad, G., Wetherell, J., & Lebowitz, B. (2005). Intensive short-term research training for undergraduate, graduate, and medical students: Early experience with a new national-level approach in geriatric mental health. *Academic Psychiatry*, 29(1), 58–65.
- Hinck, S., & Brandell, M. (2000). The relationship between institutional support and campus acceptance of academic service learning. *American Behavioral Scientist*, 43(5), 868–881.

Hycner, R. (1999). Some guidelines for the phenomenological analysis of interview data. In A. Bryman, & R. Burgess (Eds), *Qualitative research: Volume one* (pp. 143–164). London: SAGE Publications Ltd.

Klein, J. (1990). *Interdisciplinarity: History, theory, and practice*. Detroit: Wayne State University Press.

Kulig, J., Minore, B., & Stewart, N. (2004). Capacity building in rural health research: A Canadian perspective. *Rural and Remote Health*, 3(4), Article number 274. Available online at: <http://rrh.deakin.edu.au>.

Lamba, N., Maximova, K, Mulder, M., & Shankar, I. (2002). *Student involvement in the Prairie Centre of Excellence for Research on Immigration and Integration: An evaluation of academic and professional development*. A Report Prepared for the Prairie Centre of Excellence for Research on Immigration and Integration. Available online at: http://pmc.metropolis.net/frameset_e.html.

Larson, E. (2003). Minimizing disincentives for collaborative research. *Nursing Outlook*, 51(6), 267–271.

Lattuca, L. (2001). *Creating interdisciplinarity: Interdisciplinarity research and teaching among college and university faculty*. Nashville: Vanderbilt University Press.

Lau, F., & Hayward, R. (2000). Building a virtual network in a community health research training program. *Journal of the American Medical Informatics Association*, 7(4), 361–377.

Laughlin, P., & Sigerstad, A. (1990). The research administrator's role in creating a supportive environment for interdisciplinary research. *Research Management Review*, 4(1), 1–8.

Lindsay, R., Breen, R., & Jenkins, A. (2002). Academic research and teaching quality: The views of undergraduate and postgraduate students. *Studies in Higher Education*, 27(3), 309–327.

Lowry, P., & Hansen, S. (2001). Reconsidering research administration at predominantly undergraduate colleges and universities. *Research Management Review*, 12(1), 11–15.

McCormack, C. (2004). Tensions between student and institutional conceptions of postgraduate research. *Studies in Higher Education*, 29(3), 319–334.

Miner, L., Miner, J., & Griffith, J. (2003). Best and worst practices in research administration. *Research Management Review*, 13(1), 11–20.

National Institutes of Health. (2003). *NIH grants policy statement*. Available online at: http://grants.nih.gov/grants/policy/nihgps_2003/index.htm.

National Science Foundation. (2009). *Proposal and award policies and procedures guide*. NSF 10-1. OMB Control Number: 3145-0058. Available online at: http://www.nsf.gov/pubs/policydocs/pappguide/nsf10_1/gpgprint.pdf.

- Panelli, R., & Welch, R. (2005). Teaching research through field studies: A cumulative opportunity for teaching methodology to human geography undergraduates. *Journal of Geography in Higher Education*, 29(2), 255–277.
- Pendakur, K., & Yan, M. (2009). *MBC midterm review: 2007–2009*. Vancouver: Metropolis British Columbia, Centre of Excellence for Research on Immigration and Diversity. Available online at: http://riim.metropolis.net/assets/uploads/files/SSHRCMTR_Nov_09.pdf.
- Porter, S. (2006). Institutional structures and student engagement. *Research in Higher Education*, 47(5), 521–558.
- Qin, J., Lancaster, F., & Allen, B. (1997). Types and level of collaboration in interdisciplinary research in the sciences. *Journal of the American Society for Information Science*, 48(10), 893–916.
- Reimer, B. (2002). A sample frame for rural Canada: Design and evaluation. *Regional Studies*, 36(8), 845–859.
- Repko, A. (2008). *Interdisciplinary research: Process and theory*. Los Angeles: SAGE Publications.
- Robinson, G. (1998). *Methods and techniques in human geography*. West Sussex, England: John Wiley and Sons Ltd.
- Robinson, J. (1996). Falling between schools: Some thoughts on the theory and practice of interdisciplinary. In L. Salter & A. Hearn (Eds), *Outside the lines: Issues in interdisciplinary research* (pp. 85–92). Montreal: McGill-Queen's University Press.
- Ryser, L., Halseth, G., & Thien, D. (2009). Strategies and intervening factors influencing student social interaction and experiential learning in an interdisciplinary research team. *Research in Higher Education*, 50(3), 248–267.
- Seymour, E., Hunter, A., Laursen, S. & Deantoni, T. (2004). Establishing the benefits of research experiences for undergraduates in the sciences: First findings from a three-year study. *Science Education*, 88(4), 493-534.
- Smith Richardson Foundation. (2010). *International security & foreign policy program: Junior faculty research grant program*. Available online at: www.srf.org/grants/international_junior_faculty.php.
- Taylor, J, Hughes, C, Petkov, J, & Williams, M. (2005). Unique issues in research and evaluation in rural and remote locations: Is there a place for specific research training? *Rural and Remote Health*, 2(5), Article number 351. Available on-line at: <http://rrh.deakin.edu.au>.
- Wekerle, G. (1996). An interdisciplinary committee within a disciplinary research funding structure: The experience of the first two years. In L. Salter & A. Hearn (Eds), *Outside the lines: Issues in interdisciplinary research* (pp. 121–129). Montreal: McGill-Queen's University Press.
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ABOUT THE AUTHORS

Laura Ryser is the Research Manager for the Community Development Institute at the University of Northern British Columbia. Her research focuses on economic and social restructuring in rural and small town places, with a specific interest in rural poverty, organizational change and institutional capacity, and innovative approaches to delivering services in small places.

Greg Halseth is a Professor in the Geography Program at the University of Northern British Columbia, where he is also the Canada Research Chair in Rural and Small Town Studies and Director of the UNBC Community Development Institute. His research focuses on the economic and social transitions occurring in resource-based towns.
