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2020

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Project Report

Aligning Intentions with Community: Graduate Students Reflect on Collaborative Methodologies with Indigenous Research Partners

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Received: 31 July 2020; Accepted: 9 September 2020; Published: 12 September 2020

Abstract: Collaborative and community-based research (CCBR) is well defined and discussed in the literature; however, there are few discussions about graduate students doing CCBR with Indigenous communities. This project report features insights from nine graduate students attending six universities in Canada, the United States, and Brazil. These students are a part of a multi-year research partnership grant involving fishing communities from three major watersheds, the Mackenzie River Basin, the Amazon River Basin, and the lower Mekong River Basin. Each student engaged in collaborative research around the themes of Indigenous fishing livelihoods and the role of local and traditional knowledge in river basin governance. This project report presents reflections of graduate students on developing relationships and enacting CCBR during the following three stages of research with Indigenous communities: research project design, research project implementation, and post-project engagement. Best practices have been developed from graduate student reflections on issues, challenges, and needs of graduate students doing CCBR. The findings suggest that a diversity of factors contribute to effective CCBR. This includes the needs and interests of the community partner, the quality of supervisor support, the skillset of the student, their disciplinary background, and their capacity to work in complex sociopolitical contexts.

Keywords: collaborative research; community-based research; indigenous communities; graduate students; indigenous graduate students; fishing livelihoods; best practices

1. Introduction

Collaborative and community-based research (CCBR) is a growing methodological approach in Canada and globally [1]. Guided by histories and principles of participatory action research (PAR), CCBR calls for the creation of more equitable relationships in the production and sharing of knowledge,

including the knowledge of Indigenous peoples. In that context, it is sometimes viewed as important to the decolonization of research, as well as to address social and environmental sustainability [2–5]. Graduate students are often on the frontlines of navigating reconciliation between the Academy and Indigenous peoples. However, there is a gap in understanding the perspectives of these graduate students, including students who are networked together in large team projects. This project report presents reflections of graduate students on developing relationships with Indigenous communities and enacting CCBR during the following three stages of research: research project design, research project implementation, and post-project engagement. Best practices have been developed from individual written reflections on the issues, needs, and challenges of doing CCBR. Written reflections arose from a collaboration between nine graduate students from six universities; this includes both non-Indigenous [6] and Indigenous scholars [3] who were networked together as part of a multi-year research partnership focused on fishing livelihoods in the Mackenzie River Basin, Amazon River Basin, and the lower Mekong River Basin (Tracking Change: Local and Traditional Knowledge in Watershed Governance. www.trackingchange.ca). With the aim of learning from their own experience, one another, and advancing scholarship on the practice of CCBR, this project report presents insights from their research experiences with different community research partners in nine different case study regions. The majority of these research collaborations were centred in the Mackenzie River Basin with Indigenous organizations, governments, and co-management boards. Reflections suggest that there is a diversity of factors that influence the success of students and projects involving CCBR approaches. Common themes relate to balancing time in the field with the realities of academic timelines, willingness to adapt to the community context as well as ensuring opportunities for co-creation of knowledge at all stages of the research process.

1.1. Collaborative and Community-Based Research

Collaborative research is a general framework for describing the many and varied participatory and community-based research methods, including PAR, originating in the 1970s, and community-based participatory research (CBPR), originating in the 1990s. Both PAR and CBPR are compatible with Indigenous research methodologies [1,6,7], in that both approaches recognize communities' research partners as a source of relevant expertise with the capacity to inform research design and decision-making processes [1]. Both approaches encourage participatory collaboration and power-sharing [1,8]. CBPR has evolved in Canada alongside the growth of Aboriginal political autonomy at the community, national, and international levels [4] (p. 28). With increasing ability to exercise authority, Aboriginal communities have begun to look at "the historical role of research in generating the difficult conditions within many Aboriginal communities and in helping shape the political structure of internal colonialism that characterizes the relationship of Aboriginal people with the state" [4] (p. 28). CBPR methodology is compatible with this questioning of research practices by communities who have experienced being the focus of research in that CBPR recognizes that "the social and political contexts in which research takes place must be recognized and their influence incorporated into research question development, project design and the dissemination of results" [1] (p. 30).

Relationships between Indigenous communities and researchers have been reshaped by such movements towards collaborative methodologies over the last thirty years, particularly in northern Canada. For example, CCBR and variants of CBPR and PAR are favoured methodologies by Indigenous communities, as evidenced by statements to this effect in community research guidelines [9,10]. Ethical codes of research with Aboriginal peoples have been created and embedded at different levels of research activity, from community to federal government funding bodies [11–13]. This is particularly true in respect to the documentation of local and Traditional Knowledge [14,15]. Research agreements between academic researchers and regional and local community partners have become an increasingly common practice [1,10]. However, aspects of the process of developing a relationship between researchers and Indigenous communities are still uncertain, particularly for graduate students. There are few published resources focusing on the actual practice of developing relationships with Indigenous

research partner communities [16,17]. Though graduate students in many disciplines have been introduced to Indigenous research methodologies that "privileges Indigenous concerns, practices and participation as researchers and researched" [5] (p. 190), they can still struggle with how to apply these approaches to their own research practice [16]. CCBR methodology emphasizes the participation of research partners in all aspects of the research including the selection of the research question, data collection and analysis, and sometimes dissemination of results [1,18]. CCBR methods also emphasize that the research partner must benefit from the research. This method offers a chance for communities to build research capacity, and through the process, realize their own competence and knowledge [6]. CCBR methodology is being developed and used in various academic disciplines, most commonly health research [19,20], anthropology [21], and feminist research [22].

1.2. Graduate Student Experiences with CCBR

Despite this growth in the development of CCBR, little attention has been paid to the experiences of graduate students who, along with communities, are often on the frontlines of interpreting and realizing what and how principles of community-based research can be enacted [23–27]. Klocker (2012), drawing on her experience as a human geography doctoral student, notes that the small handful of literature "specific to PAR PhDs" provided little help or guidance to her as a student [25] (p. 157). This project report addresses this major gap in the literature.

Within the existing literature, some key issues are consistently highlighted. For example, students are urged to not rush their research activities and to spend significant time in developing meaningful local relationships. "Spending time . . . is essential to establishing relationships based on mutual trust" [26] (p. 168). This time is also key to ensuring that community researchers can become "competent co-researchers" [27] (pp. 244–245). However, multiple papers noted frustrations around working with different academic and community timelines [23,26]. Moore suggests that she did not have enough time to do a "truly participatory study," because her program required a research proposal without having spent time with a partner community [23]. "If I were to wait until this stage were completed, I would risk not completing my doctoral program within a reasonable time frame" [23] (p. 157). Concerned with starting her research "grounded in people's lived experience," she wonders how to frame research questions and an ethics proposal before meeting the group she might work with while also spending the first two years of a doctoral program doing classes and exams [23] (p. 158). The community, the student, and the project are all factors in the variation of project timelines. For some students, a collaborative project that makes a difference is possible, although not ideal within a doctoral program timeframe [24,25]. Sustaining a long-term and deep relationship between the researcher and the research community can be constrained by funding, particularly if geographical distances between them are significant [27]. A common funding situation in CCBR projects is that funding bodies often do not provide financial support for results dissemination and outreach [27]. Graduate students are working within a climate of hypersensitivity to the importance of and subject of decolonization [16,28,29]. For example, Klocker [25] came to choose a participatory methodology after reflecting on whether she was a "colonizing western researcher," or whether she knew enough about her subjects in their contexts for her project to benefit them in a way that they actually needed (p. 151). This can be particularly challenging for non-Indigenous students and those who are considered outsiders or not members of the Indigenous group [17,24,30]. This research report adds to the discussion on some of the areas outlined above by offering some insights on how to put the principles of CCBR into practice. Further, we suggest some best practices for other graduate students working collaboratively with Indigenous partner communities.

2. Methods and Methodology

2.1. Guiding Principles of Collaboration

In writing this project report, a collaborative approach was developed between the graduate student authors, all of whom were engaged in fishing livelihood research in the Mackenzie River Basin, the Lower Mekong, and the Amazon River Basin. This approach mirrored the collaborative approach built into the larger Tracking Change project methodology and was characterized by a set of "Guiding Principles" related to research collaboration (Table 1). Guided by the literature on decolonizing methodologies, intellectual property rights, and human ethics research guidelines (i.e., Canadian Tri-Council Guidelines), this checklist was developed in an effort to provide students and other academics with defined action items to guide the user in respecting the local and Traditional Knowledge of partner communities. This project report builds on this checklist by contributing discussion about how the steps might be practiced.

Table 1. Tracking Change Project Checklist for Community Engagement.

Research Project Design.	Research Implementation	Post-Project Engagement
Solicit input about the research project prior to the start of the research.	Hire a community researcher.	Provide copies of research outcomes (raw data) to the community and/or to the research partner organization.
	Verify research outcomes with interviewees or focus group participants.	Include the research partner or participants in local/regional sharing outcomes (e.g., local public meetings).
	Include the research partner/organization in the interpretation of research outcomes.	Include a representative of the community partner organization/research partner as a co-author of presentations or publications.

2.2. Graduate Student Authors

The initial group of students numbered eleven; however, over time, two students withdrew their participation due to a change in research focus and a need to focus solely on doctoral program requirements. Students, attending (6) different universities, were all supported in some way by the Tracking Change project; however, the particulars of funding details and university policies affecting each student were not discussed beyond the existence of limitations in funding and program length. The graduate student authors, from a variety of disciplines (e.g., ecology, environmental sociology, geography) (Table 2), were working with diverse research partners (see Table 3) and were at different stages of their research program at the time the reflections were submitted and, as a result, are at different stages of thinking through the issues discussed here.

Only one student supervisor played a significant role in the writing of this project report. Parlee, the third author, provided guidance and writing assistance and is the supervisor of five of the authors, as well as the Principle Investigator of the Tracking Change project. Students drew on the relationships of their supervisors with the partner communities with differing degrees of success, as detailed in the Results. Community partners were not asked to be informants in the development of this project; however, they are engaged in the reflection process for a subsequent manuscript on research collaboration. At the time of writing the submissions for this project, the majority of the authors were masters students who had recently completed their fieldwork. Given this, the students were early in the reflection and data analysis process, and this is reflected by the Results, the majority of which correspond with the first, second, and briefly, the fifth, of the Tracking Change Guidelines.

Table 2. Student Researcher Disciplines and Programs.

Author	University	Discipline	Program
D'Souza	University of Alberta	Environmental Sociology	MSc
Freitas	Universidade Federal do Rio Grande do Norte	Ecology	PhD
Heredia	University of Ottawa	Geography	MA
Martin	University of Alberta	Environmental Sociology	MSc
Oloriz	Royal Roads University	Environment & Management	MA
Proverbs	University of Victoria	Environmental Studies	MSc
Soukhaphon	University of Wisconsin-Madison	Geography (People-Environment)	PhD
Spicer	University of Alberta	Environmental Sociology	MSc
Wray	University of Alberta	Environmental Sociology	PhD

2.3. Materials

This writing project was inspired and initiated in 2017 from student conversations about the similarities and differences between individual experiences of CCBR. Following an initial face-to-face meeting in April 2017, eight conference calls and another face-to-face meeting were held between 2017 and 2019. Once agreement was made among the students that a manuscript should be developed based on their reflections of their research experiences, each student began to prepare 1–2-page written reflections about the opportunities and challenges of their collaborative research experiences. Initial group discussion led to agreement on the theme of "aligning intentions with the research community" and the question "*What challenges, issues and needs did you have while attempting to align intentions with the research community through the practice of CCBR in your research*?" as a guide for the written reflections. No interview guide was offered beyond this question; students wrote about what collaborative methodologies meant to each of them.

2.4. Narrative Analysis

Once completed, the 2-page narratives were shared amongst the group and each submission read by all others. A process of thematic analysis was undertaken [38,39]. First, the written submissions were coded for common themes and ideas. Initial categories included 29 advice or success stories (what worked), and 15 challenges (what did not work). Areas of high agreement (suggested by 3 or more students) shaped major sections going forward. The 44 themes were consolidated into 6 initial categories (positionality, time, relationships, effective research, power relations and researcher legitimacy, and the nature and quality of data). Small groups of authors were organized with the purpose of synthesizing the literature and key narratives related to each theme. The lead, second, and third author further synthesized the outcomes of the small group work into one major summary. Common themes and patterns were identified and excerpts from each author's story were woven together (see Results). Initial areas of focus included research needs, timelines, readiness to do research, ensuring that benefits of the research accrue to the research partners, and finally, recognizing and respecting worldview differences, and closely related, the need for students to be flexible in their own beliefs and methods. It was not immediately obvious how to organize and prioritize the quotes and written insights; however, the organizing categories of research project design, research project implementation, and post-project engagement were chosen. The results and discussion that follow highlight the diversity of factors that were perceived by these graduate students to influence the success of their research collaborations. A set of best practices have been developed from the results and are presented in Table 4.

Table 3. Research Project Settings.

Researcher-Author	Project Title	Place/Region & Community Partner	Summary of Project Focus
D'Souza	Diversification of livelihoods in a region impacted by hydroelectric development: A case study in the Lower Mekong (Mun River/Sebok River).	Mun River and its tributaries, Thailand; Communities: Baan Kho Tai, Baan Huay Mak Tai, Baan Don Sumran, Baan Wangsabang Tai, Baan Thalat, Baan Doom Yai, Baan Na Choom Chon, Baan Hua Hew #4, and Baan Hua Hew #11.	To understand how households and Lao communities, reliant on the Mun River and its tributaries, are coping with changes in local aquatic ecosystems and their fishing livelihoods as a result of the Pak Mun Dam [31].
Freitas	Arapaima fisheries co-management in the Amazon: Ecological, social, and cultural aspects.	Riverine communities of the middle Juruá River and the lower Purus River, Amazonas state, Brazil.	To study the nuances of the ecological and socioeconomic outcomes of local initiatives of Arapaima fisheries management [32].
Heredia	Implications of socioecological changes for Inuvialuit fishing livelihoods and the country food system: The role of local and Traditional Knowledge.	Inuvik and Aklavik in the Mackenzie River Delta, Northwest Territories (NWT), Canada; The Fisheries Joint Management Committee.	To understand the implications of socioecological changes in the Mackenzie River Delta for Inuvialuit fishing livelihoods and the country food system, drawing from local and Traditional Knowledge [33].
Martin	Times of change: Traditional Ecological Knowledge in the Sahtú Region.	Great Bear Lake, NWT, Canada; Hamlet of Déljne, Déljne Got'ıne Government, and the Sahtu Renewable Resource Board.	Exploring Déljne Got'ıne (the people of Déljne) cultural conceptions of climate change; linkages between environmental fluctuations, impacts to fishing livelihoods, and the well-being of the people of Déljne [34].
Oloriz	Towards biocultural diversity conservation. Knowledge, cultural values, and governance of species at risk: The case of the White Sturgeon (Canada) and the Mekong Giant Catfish (Thailand).	Stó:lō Coast Salish fishers and the White Sturgeon population of the Lower Fraser River, British Columbia, Canada; the fishers of Baan Had Krai (ethnic Lao villagers from the Dai Yuon Tribe) and the Mekong Giant Catfish population of the Mekong River in Northern Thailand, near Chiang Khong in the Chiang Rai Province.	How to elevate the role of Traditional Ecological Knowledge and Indigenous cultural values in decision-making processes that affect local ecosystems and livelihoods? By highlighting collaborative efforts between local fishers and government to create conservation strategies that protect both biological and cultural diversity [35].

Table 3. *Cont.*

Researcher-Author	Project Title	Place/Region & Community Partner	Summary of Project Focus
Proverbs	Social-ecological change in Gwich'in Territory: Cumulative impacts in the cultural landscape, and the determinants of access to fish.	Gwich'in Settlement Area, NWT, Canada, incl. the communities of Aklavik, Fort McPherson, Inuvik, and Tsiigehtchic; Gwich'in Renewable Resources Board, Gwich'in Tribal Council Department of Cultural Heritage, Renewable Resources Councils in Aklavik, Fort McPherson, Inuvik, and Tsiigehtchic.	To increase our understanding of social-ecological changes occurring in Gwich'in territory by examining cumulative impacts occurring in the Gwich'in cultural landscape, and by exploring the determinants of access to fish, and the relationship between fish and well-being in Gwich'in communities [36].
Soukhaphon	Damming rivers, undamming difference: The politics of engendered knowledges and networks in the ethnic Lao spaces of the Lower Mekong Basin.	Transboundary region of northeastern Thailand, southern Laos, and northeastern Cambodia.	The research addresses the different ways that ethnic Lao people interpret and respond to hydropower development projects that are increasingly under criticism by scholars and non-governmental organizations (NGOs).
Spicer	Drinking water for northern Canadian Indigenous communities.	Dene Tha First Nation, Kátł'odeeche First Nation; High Level, AB and Hay River, NWT.	Documenting the experiences of many Indigenous communities across Canada in accessing clean, drinkable water [37].
Wray	Making a place for Indigenous fishing livelihoods: Navigating cross-scale institutions in Great Slave Lake commercial fisheries management.	Great Slave Lake, NWT, Canada; Kátł'odeeche First Nation.	Exploring the role of the Aboriginal user communities and rights holders in the evolution of Great Slave Lake commercial fishery management institutions.

Table 4. Results and Best Practices.

Organizing Category	Organizing Sub-Category	Tracking Change Guidelines	Results & Best Practices
Research Project Design	Perceptions and Reflexivity on research experience	Solicit input	Recognize your strengths, weaknesses, and aptitudes
Research Project Design	Perceptions and Reflexivity on research experience		Overcome discomfort and push your personal boundaries
Research Project Design	Perceptions and Reflexivity on research experience		Appreciate the complexity of your role as an insider or outsider, or both
Research Project Design	Project scope: Defining the research		Imagine doing the research in a way that benefits or positively impacts community partners
Research Project Design	Project scope: Defining the research		Adapt project focus and methods in response to on-the-ground reality
Research Project Implementation	Navigating timelines		Engage with people on the land and at community cultural events
Research Project Implementation	Navigating timelines		Draw on your supervisor relationships and networks to minimize challenges
Research Project Implementation	Navigating timelines		Be adaptable to community and respondent timescapes
Research Project Implementation	Ensuring benefits for community partners	Hire community research assistant	Engage with and hire community research assistants and involve youth wherever possible
Research Project Implementation	Ensuring benefits for community partners		Consider every tool available to you to benefit your research partners
Research Project Implementation	n/a	Verify research outcomes	n/a
Research Project Implementation	n/a	Include community partner in data interpretation	n/a
Post-Project Engagement	n/a	Share research outcomes	Return research results and outcomes to the community partners
Post-Project Engagement	n/a	Shared dissemination	n/a
Post-Project Engagement	n/a	Co-publish	n/a

3. Results

The results are organized and presented in three categories. Section 3.1, research project design, considers issues related to personal attributes of the graduate student and the importance of adjustments in response to on-the-ground realities. Section 3.2, research implementation, considers navigating academic and community timelines and ensuring benefits for research partners. Finally, Section 3.3, post-project engagement, focuses on reporting results to the research partner. Finally, Table 4 presents a summary of the results and best practices from each section. Since many of the student authors began this project before completing their projects, there are more observations in the first 2 sections than there are in the third section.

3.1. Research Project Design

The Tracking Change project guidelines emphasize the importance of engaging communities in the research project (Table 1) [40]. Students realized upfront engagement in different ways, ranging from how choices were made around the use of quantitative and qualitative approaches to the timelines that were set for engagement. Research design was influenced by many factors, such as personal circumstances. For example, some of the students are international students, or students with full- or part-time jobs and other commitments. There was a range of aptitudes and readiness among the students for this kind of research, as evidenced by their quotes presented below as well as differences in how much groundwork had been done with the community partner prior to the student arriving there. Finally, graduate student projects prioritized community needs with the hope that, through collaborative research, the capacity of partner organizations would be enhanced. In realizing this ideal, students faced other issues discussed here in terms of graduate student perceptions of the research experience and some factors involved in determining the scope of the research.

3.1.1. Graduate Student Perceptions of Research Experience

Different students involved in the research projects had a range of perceptions of their research experience and were reflexive of their own values, experiences, skills, and knowledges as well as their relationships to research partners. Some students felt that engaging with the research partner was difficult, and they attributed this to limited experience of research and working in a cross-cultural setting. Recognizing one's own strengths, weaknesses, and aptitudes is key to the ways in which research collaborations develop and unfold.

> The personal trials in this work can be significant, if not immense. This aspect of the work is unexpected for many students. The transformation you will undergo is not mentioned in the application process for graduate school. Not everyone is suited to the unique demands of community-based research work, especially in a cross-cultural situation. To achieve the goals of the research as well as benefitting the partnering community, one must work hard on the everyday and unexpectedly stressful work of finding people to interview, cold calling (even a great research assistant is not going to do all this work for you), meeting new people and engaging in a highly unfamiliar ritual with them involving knowledge exchange, often on sensitive topics. Personal traits such as introversion or extroversion can affect this experience significantly (Wray).

A student discusses her unease with the experience of calling potential interviewees over the phone.

> The individual's personality can be considered as a barrier, especially regarding the ability to react to the unpredictability of the research. For instance, at one point in the research, I had to telephone people in the community to find people to interview, despite feeling uncomfortable calling people I did not know.

The capacity to overcome discomfort and push the boundaries of one's comfort level is part of doing this kind of research. One graduate student talked about the importance of "getting comfortable

with being uncomfortable" (Martin). Others said that sometimes pushing oneself is about small things; for example, checking in regularly with a staff member, volunteering to help out at an event, or really pushing oneself to do something big like organizing and hosting a community meeting about one's research or lead the development of a field activity (e.g., fish camp). Some researchers felt that their long-term relationships and familiarity with the cultural context of their research partners enabled them to engage more deeply with the community. For example, Indigenous students (Martin, Proverbs, Wray) working with Indigenous populations generally felt they had a meaningful experience but highlighted some of the complexities of Indigenous identities and expressed concern or discomfort about not working in their own communities (i.e., a student from an Ontario First Nation working in a northern Dene community).

One student's concern centered around not knowing the appropriate protocols around knowledge exchange. This was a direct result of a family history of residential schools and adoption and subsequently being raised with limited knowledge of her own community protocols. Another student considered herself an outsider to her research community despite being a member of the greater Canadian Indigenous collective and a member of a First Nation in southwestern Ontario. This understanding that she was still an outsider to her research community made her initially highly sensitive to uncertainties around positionality.

Another researcher felt he occupied a hybrid space between being an insider and an outsider. As a member of the Lao community with which he worked, he was able to gain insider access with ease. At the same time, he explained how his position as both researcher and community member came with a unique set of concerns.

> My intimate knowledge of the community did give me access to members I otherwise may not have known. On the other hand, because of my social proximity to my research participants and the personal nature of my questions, there was a reluctance among many participants to share their stories about traumatic, yet formative histories (Soukhaphon).

This student suggests that, in the latter case, the issue may have been related to the theme or focus of the research or cultural norms of participants as much as it was the relationship between the researcher and the community. In Southeast Asian cultures, it is common for those in positions of higher social status to guard against appearing to be wrong or to fail, insufficient materially or otherwise, and physically or emotionally weak. Subsequently, questions about displacement, loss, and regret were often met with silence, subtle resistance, and resentment. Another researcher described her feelings of "outsiderness" and reflected on different aspects of power relations associated with being "white" and from Canada while working in Thailand. However, what may have been perceived initially as a barrier to partnership was later perceived as an opportunity; interviewees expressed gratefulness that they could participate in a study that would bring their ideas and concerns to global audiences.

> The first problem I experienced was fear about working with local communities, or whether or not I was the right person for this project. As a white woman, it was hard to decide what my role was or how involved I could be with communities. As someone who has never travelled to Thailand before this project, I did not know what to expect from the community people, or what their expectations would be of me (D'Souza).

This discomfort and disconnection between research activities and research community was also felt by some non-Indigenous students working in Indigenous communities in Canada.

> I am very aware of my privileged position towards a population that has been historically abused (and is still marginalized nowadays) where science has played a major role. Although my intentions seem fair, there is a question coming through my mind throughout the whole research process: Do I have the ethical legitimacy to work on this topic? (Heredia).

A different experience was shared by another non-Indigenous researcher who had no initial knowledge of the Indigenous research community, "I left feeling that the communities not only

approved of my research but the participants felt it could be beneficial to them and their community." (Freitas). This section demonstrates variability in experience; however, what is common to them all is an awareness and reflexivity of their positions as researchers.

3.1.2. Project Scope: Defining the Research

For some students, imagining the possibilities of how to carry out the research in a way that benefits or positively impacts community partners, in other words "giving back," was critical to their decisions about how to frame the research and work with the research partner.

> My ultimate goal was to support to local initiatives by using my data to show how those local initiatives are really changing local realities ecologically, economically and socially. They [the community partners] helped me with that. Even after changing the idea of my project and trying to delineate my interview questionnaires according to feedback, I ended up changing those questionnaires many times whenever I discussed that with someone there. It was an important learning process of trying to align intentions (Freitas).

In cases where students were working on a topic that they felt they understood only academically (i.e., from book learning and not from lived experience), being adaptive in terms of both focus and methods was critical.

> Initially, I went up to the communities with a set of questions that had been created prior to discussion with the community . . . However after a few interviews, it became apparent that there was commonality in the answers between the interviewees and it would be beneficial if more questions were added to help clarify the situation and help to refine the data obtained. Therefore, the interview questions were adapted to better obtain answers so that there was more consistency in the material obtained . . . I was able to adjust the questions to allow easier data gathering and analysis. But because I wanted to compare across communities, I also had to ensure not to change the questions too much, or it would be difficult to make comparisons between the two datasets (Spicer).

Seeking out community direction on interview questions, one student suggested that

> Sometimes we won't get it right. It is important to get input from our community partners and from the people we are interviewing. As outsiders, we may be asking the wrong questions all together. We need to accept that the people we are seeking out are the experts and we need to be open to their direction and insight. Humility is key (Oloriz).

This graduate student points to another purpose of questions, that is, to stimulate conversation, and suggests being adaptive in how you deploy questions to achieve this:

> I also asked for the advice of community partners about the questions I hoped to ask individuals to stimulate conversation. I use the last sentiment intentionally. As community researchers, we have to be flexible in how we plan to collect our information and be prepared to change our methods, questions and expectations if our original plans don't work. Research questions should only be thought of as a guide - a framework if you will. Not everyone will have the same knowledge, or be willing to share the same level of information with us (Oloriz).

In this student's experience, "flexibility adds to the richness of the data generated at the end of it all. Sometimes the 'tangents' in conversation lead us to the heart of the matter – things we never would have thought of" (Oloriz). This first section centers around the importance of student awareness of self and personal capacities for CCBR, as well as on designing a project with community benefits as an outcome and readiness to adapt a project to local realities.

3.2. Research Project Implementation

In this section, students reflect on the process of implementing their research design. Students must navigate academic and community timelines as well as try to ensure that the research partner benefits from the project. Graduate student experiences suggest that engagement with local people, drawing on established supervisor networks, and being adaptive to respondent availabilities for participation can help to achieve balance between academic program goals and creating benefits for research partners. Specific examples include hiring a community research assistant and taking an innovative approach to determining how a particular project might benefit partner communities.

3.2.1. Navigating Academic and Community Timelines

The allocation of time for relationship building is an important aspect of CCBR, as noted by all of the students. However, many students struggled with the perceived short timeline imposed by academia and the ideal of building relationships with communities over a longer time horizon.

> At the university, a master's student is [sometimes] expected to conduct research and write their thesis within a two-year period. This tight timeline can be very restrictive in any subject matter, never mind when you are dealing with extensive travel to northern communities and the possible complexities of working within First Nation communities. It can be very challenging to go into a community that is often suspicious of outsiders and try to conduct research, asking questions of individuals who are wondering why you are there (Spicer).

Spending time with people as well as time "on the land" was also critically important to relationship building. One student described how spending a few months in the geographic area she was working within has benefited her work in two main areas: increased contextual understandings, and opportunities to give back to communities. As a result, these two benefits have helped her build trust with communities and conduct research that aspires to be valuable and beneficial to them. She explained that she was able to develop a deeper understanding of the issues she was studying each day that she was in the community or on the land with local people at events and fish camps, feeling the ebb and flow of life in these places. As a result of this time and effort to learn, the process of carrying out research was transformative for her at a personal level. "The personal impact of this time is immense, and I would argue, so is the impact upon my research" (Proverbs). However, other students struggled with the idea and logistics of spending many months living and working in a community while doing thesis research. This was often due to the student's lifestyle or other needs and commitments, including financial. For example, some students had families at home and spending more than 2 weeks away was not possible. Other students had financial constraints.

> [Because of my business it was] impossible for me to go up and stay for extended periods of time in the communities to develop the necessary relationships so that I could conduct research on my own (Spicer).

Students took unique approaches to navigating academic and community timelines and expectations. For example, the solution for the speaker of the quote above was to conduct interviews at a cultural event, using his vehicle as his office, and going from campsite to campsite doing interviews at times when it was convenient for the interviewees. In actuality, although it was not part of his original "plan," he suggested that the time spent at the cultural event was the most enjoyable time that he had as it allowed him to have a glimpse into their way of life while interacting with community members in a less stressful environment.

Another issue regarding time related to the relationship between student supervisors or committee members, and partner organizations and staff. Sometimes supervisors have existing relationships with partner communities that students can draw upon.

> I have had the fortune to be in this situation, and I don't think that I would be able to conduct my research quite the same without those relationships. When the trust has already been

> built up for you, it can be a great privilege to have yourself introduced by someone, or to introduce yourself and say that you're associated with people that community members or organizations already know (Proverbs).

Similarly, this student emphasizes the essential nature of networks and relationships to being able to do research at all.

> My research in Thailand would not have been possible without the support of my supervisor and the Mekong School, who was able to connect me with an environmental non-governmental organization (ENGO) that had done previous Thai Bann research in northern Thailand. Her relationship with the ENGO, and the ENGO's relationship with community members were literally the only reason I was able to connect with so many individuals that had experience and knowledge of the Giant Catfish and the Mekong River (Oloriz).

Another student planned to work with the same communities with whom his supervisor had previously worked for many years. He felt that his research project would proceed smoothly and efficiently, because he benefitted from the established trust that arose from the long-term relationship between his supervisor and the communities. Conversely, another student felt that the lack of a long-term relationship led to confusion and complications about what was expected and possible through the research project.

Some students commented on feeling rushed to complete their research activities. Two students suggested that overcoming feelings of being rushed was important to the success of their research. "I think that perhaps taking time in community, answering questions, and feeling calm and not rushed helped me be myself and build authentic relationships" (Proverbs).

> One of the main issues I had was organizing a designated time for interviews. We would be calling participants the night before to see who would be available and when, but even when we tried to set up an interview for 10 am it normally wouldn't actually begin until much later. I do realize that because we were only there for a short while that things were going to feel rushed already and I am hoping that since I will be there for much longer this summer it won't feel as pushy and rushed (Martin).

Some students discussed the importance of respecting the research partner's time and priorities.

> There is a significant fatigue towards research in northern communities, given the overload of projects along with their lack of impact, which affects our ability to engage community members (Heredia).

> Understand that members are living their lives and should not be expected to change their plans so that you can conduct an interview. Be flexible and understand that timings can often seem to be more of a suggestion, not necessarily a firm set in stone occurrence (Spicer).

One student suggested that a positive attitude and a genuine interest in learning from the community is a key dimension of the relationship building process, and this enabled her to overcome other setbacks in terms of time and support.

> When I am in the community, I have infinitely more opportunities to receive these opportunities and teachings from the land and community members, to bolster the knowledge and data gained through other research methods (Proverbs).

This last quote suggests that community connections that smoothed the process of research.

> As researchers, we are often put in the precarious position of entering an unfamiliar environment and asking community members to share personal information about their lives and relationships to the land, waters and the other people in their community. This is

> a daunting task, especially when time is limited. In these circumstances, the value of having someone from the community you are visiting involved in your research cannot be underestimated (Oloriz).

This section has considered the ways in which students experienced the requirement to build relationships on the ground with their partner communities and the academic program requirement of completing a masters program in two years. Suggestions include spending time with people on the land and at cultural events, drawing on supervisor networks and relationships, and finally, being aware that your project may not be top priority for community partners as it is for you.

3.2.2. Ensuring Benefits for Community Partners

This section considers some approaches to ensuring that benefits accrue to community partners from the research. Balancing the goals of academic benefits for the researcher (i.e., a thesis project) as well as capacity building for the partner community can be difficult, as discussed below. The choice to hire a local research assistant and involve local youth in the project, as well as the use of different methods (qualitative, quantitative), can support the achievement of community benefits.

Some students welcomed the opportunity to live in and with the partner community for many weeks and sometimes months while developing and carrying out their research. This immersion enabled students to address the cultural and geographic distance that can exist between students and communities and sometimes can act to hinder the creation of benefits to the community partner.

> During this pilot fieldwork, which lasted a few months, I collected no data at all. I was just meeting people, spending time with them, observing their fishing activities, understanding their main concerns (Freitas).

Learning the language of the local community is another way to address this cultural distance. One student spent three months in an intensive language-learning course prior to her research to ensure that she could better communicate with people in her partner community. "I truly believe that learning the language and attempting to communicate with villagers myself was the best thing I could have done to build rapport" (D'Souza). A student working with communities in both Canada and Thailand reminds us not to underestimate the power of food as a way to connect with a community of people, "I like to bring food as a gift to those that I am interviewing (berries, jam, smoked fish). I also think sharing a meal together is one of the fastest ways to build a relationship and find common ground" (Oloriz). She suggests that we "eat everything" and that embracing local foods is a tangible way for community members to see that you are invested in learning about the local way of life, and that you are appreciative of their culture.

Students who worked closely with researchers and youth from the community felt that their research project came closer to realizing the ideals of CCBR (i.e., ensuring benefits for communities). For one researcher (Proverbs), engaging in other capacity building and trust-building activities that do not directly relate to "data collection" was critical. For this student, being able to visit the four communities she worked within before, during, and after data collection has allowed her to give gifts to participants, hire youth assistants, and share their research through events such as public talks or a session at a local high school. While these sorts of tasks do not always directly relate to data collection and analysis, they do provide opportunity to give back, while allowing the research to focus on process as much as outcome, and to have an impact beyond gathering and presenting data.

Other researchers discussed the value of engaging community researchers, because it enabled them to be more productive and efficient (i.e., fewer trips, less time required to carry out the research).

> [The community researchers hired for the project] were crucial to my success and without their help I would have extensively less data to work with. They were also essential in dealing with people who did not speak English and needed a translator. Although they were paid well for their work, this worked out better in the sense of overall costs of the research in

> that I was there for ten days in each community versus two or three months. This meant my overall living expenses were extensively lower due to my shorter trips (Spicer).

For another student, connections with people in research partner communities are highly valued.

> The value of having someone from the community you are visiting involved in your research cannot be underestimated. This helps researchers not only identify who they should be speaking to, it helps with logistics (i.e., setting up meetings, travel to and around the community) and with building trust. It also makes sense to "invest" in the communities we are working in by paying local assistants and sharing some of the benefit of our work (Oloriz).

Another key concern in the implementation of the research is the use of different kinds of data collection methods. The majority of the students used qualitative methods, including semi-directed interviews, to document the experience and insights of community participants. However, several students used quantitative methods as well as different kinds of technologies (e.g., GIS technology) as part of their research approach.

One student experienced the tensions between qualitative and quantitative methods within the Academy firsthand as she did her masters project with qualitative methods within a department strongly focused on quantitative methods. Upon reflection, fears about having to defend her choice to use qualitative methods were unfounded, and her experience in the field positively reinforced her choice of methods.

> When I went to the field my feelings changed. I had to reaffirm to myself why I decided to undertake this kind of research, and why I thought this was so relevant. We have to work with what we think is important and motivating for us and for the local people who we really care about (Freitas).

Some students emphasized the value of quantitative methods. For example, short surveys enabled them the opportunity to engage with many more community members than would have been possible through a lengthier semi-directed interview, including youth and young adults who are less likely to use a narrative (story telling) approach in the sharing of their knowledge. Another student emphasized the value of quantitative methods in creating numerical outcomes that might be more digestible by certain audiences (e.g., government). As noted by one student, the capacity to do quantitative research was a unique contribution.

> I have to admit that I realized how quantitative data could be important. I saw people changing public policies (including policies that would directly affect local people's life) because they could show evidence to support their arguments. Unfortunately, to have strong evidence sometimes it is not enough to say that a few people said something; you need to have some numbers and graphics in hand. I saw how glad local people were about those changes, so I realized that maybe this was the way I could actually help them - on one hand, I had skills to deal with numbers and analysis, while on the other, I had the interest to hear local people and understand their concerns. I tried to think how I could delineate my research in such a way that I could show in numbers and graphics some of the patterns that they were mentioning based on their empirical knowledge (Freitas).

Creating benefits for partner communities through research can be done by finding a way to balance academic benefits with partner community capacity building. Working with a local research assistant and local youth while employing different data collection methods can add to the creation of community benefits.

3.3. Post-Project Engagement

Engagement with community members after the completion of the fieldwork or research is another dimension of CCBR and can include verification of research outcomes, the creation of plain language

materials or reports, and the option of co-authoring research outcomes (e.g., publications) with the community. For many students, the extra step of data verification is significant. One student explains why taking time and covering the additional costs to take the research results back to the community is important.

> I would like to highlight the importance of going back to the field to share the results of our research with local people, and discuss that with them. I did that for my masters project and I could see how much they valued it. Of course, it is money and time expense to go one more time to the field, especially when you work in an isolated place, but that has to be included in our budget since the beginning. Firstly, local people have the obvious full right to know what exactly we did with all the information they gave us, and to expose their opinion about what we captured from what they said. Secondly, this is an opportunity to share different knowledge and perspectives with them. When I get back to the communities where I did my masters, I showed the results of my research on the floating islands, and showed examples of similar environments from all around the world. They were so impressed and grateful to see that. It made me think that, even though I could not change anything in their lives with my research, at least this moment was a good contribution I could give to them. Some of them said that if all the researchers working in the area did that, they would be much happier with the idea of having research being conducted there. Thus, I think this is the minimum we can do, thinking not only on local people their selves, but also on the future of research involving local communities (Freitas).

4. Discussion and Conclusions

As increasing numbers of academic institutions and scholars begin to envision research that leads to meaningful benefits for Indigenous community partners [1,3,5], graduate students, together with their research partner communities, find themselves on the front lines of implementing CCBR. This discussion begins by engaging with the greater literature on collaborative methods as presented in the Introduction. The outcome of this study suggests that principles of CCBR cannot be applied prescriptively. There are numerous factors that affect how, where, and when research relationships develop and to what extent they are successful. Although the needs and interests of the community partner are paramount in the research relationship, the skillsets of the students as well as their personal strengths and weaknesses are important aspects of relationship building and the success of the project. For example, students who have a fear of water should not engage in a youth canoe trip. Homesickness or a discomfort in working in a cross-cultural environment can limit a young student's ability to communicate and develop meaningful relationships.

The starting point was similar for all the students; in the Mackenzie River Basin, all projects were developed with partner organizations and communities who had expressed need and interest in developing a research project involving a graduate student. The results of the student reflections reveal differences in how each felt about their projects and their respective capacities to engage in research with partner organizations. Arguably, the skill set of each student, their disciplinary backgrounds, and ability to work in complex sociopolitical contexts affect the success and outcome of the research collaboration as much as endogenous circumstances such as the availability of a community researcher. The location of the community partner was also an important factor in the student's ability to follow and realize the guidelines of research (Table 1). For example, students working in remote areas of Thailand and the Amazon were not able to work as closely with communities due to long distances and costs of travel as well as language barriers.

Many of the results mirror issues highlighted in the literature. Previous graduate students have noted the need for adequate time and resources (funding) to develop and sustain meaningful research relationships [17,25,26]. For students working in Indigenous communities in Canada, their interpretation of where and how their research fits in the journey of decolonization and reconciliation can be among the greatest challenges. Throughout this project report, we have located graduate

students on the front lines of research, a phrase which points to an experience of simultaneous encouragement and resistance to the use of collaborative methodologies by one's academic institution. On one hand, graduate students are encouraged to engage in collaborative practices by changes to the Social Sciences and Humanities Research Council funding priorities which emphasize collaborative work with Indigenous peoples [13] and the growth of Indigenous scholarship on Indigenous and collaborative research methodologies [3,5]. On the other hand, University programs can present road blocks such as continued emphasis on fast project completion rates and the continued lack of attention to creating funding models that include funds for research dissemination to community partners, despite this being pointed out as problematic since the early 1980s [26,41]. Sandra Harding, in an address to the University of Toronto in 2015, suggested that "the real sticking point here is [that] researchers have to give up control of the research project ... the design and management of the research project has to be negotiated with the people who are the major stakeholders in the questions being asked ... " [42] (47:26). Harding gave some advice to graduate students that, though presented in caricature, highlights the core of the conflict experienced by graduate students using collaborative methodologies within an institution whose core values are in flux.

> Graduate students, don't even think of trying to design a dissertation project in collaboration with your subjects, we don't want you to do that. We want you to command it and design the whole thing and we want to know, you to know, what you are doing, we want you to do colonial research. You design the thing and do some nice little polite things with the people you are studying and try not to injure anybody but we want you to control the design of the research project. I'm caricaturing what I know, darn well, is our stance [42] (49:50).

Graduate students, acting as extensions of the university in the world, contribute to the evolution of the academy itself by engaging in collaborative research relationships with Indigenous communities. Simultaneously, students engage with the university in its institutional evolution by challenging long-established boundaries within the academic research tradition as students undertake collaborative research that prioritizes equitable approaches to knowledge creation [3] and increasingly share the control over research project design, data analysis, and interpretation with partner communities [5,26]. This approach runs counter to the historical position of the university as the site of truth or authoritative knowledge, a position which has come under increasing critique from Indigenous and feminist scholars [18,43]. Attention to previously subjugated knowledges (e.g., Indigenous Traditional knowledge) increases as we search for new approaches to ensuring the environmental and social sustainability of our planet [44].

A limitation of the project report was the short time available to reflect on these complex issues of decolonization and reconciliation. Further work on the topic might include a second iteration of the project with a special focus on power and positionality, or a general survey of Canadian graduate students working with collaborative methodologies. This manuscript is unique in sharing the combined reflections of nine graduate students from a research network who were similarly engaged in CCBR on fishing livelihoods from three river basins. It is the authors' intention that this contribution of lessons-learned might assist graduate students and others doing CCBR around the world.

Author Contributions: Conceptualization, K.W., A.S., B.P., A.D., C.F., I.H., C.M., C.O., T.P., and N.S.; methodology, K.W., B.P., A.S.; formal analysis, K.W., A.S., B.P., A.D., C.F., I.H., C.M., C.O., T.P., and N.S.; investigation, K.W., A.S., B.P., A.D., C.F., I.H., C.M., C.O., T.P., and N.S.; writing—original draft preparation, K.W., A.S., B.P.; writing—review and editing, K.W., A.S., A.D., I.H., C.F., T.P.; supervision, B.P. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by the Social Sciences and Humanities Research Council of Canada through the Tracking Change: Local and Indigenous Knowledge in Watershed Governance project (SSHRC PG 895–2015–1024 Parlee), the Northern Scientific Training Program, and the University of Alberta Northern Research Awards.

Conflicts of Interest: The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.

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