

Team Dynamics and Learning Opportunities in Social Science Research Teams

Michelle K. McGinn¹, Ewelina K. Niemczyk²

¹ Brock University, ² North-West University, South Africa

Although the contemporary research environment encourages knowledge generation through research collaboration rather than individualized projects, limited scholarly attention has been devoted to the practice of collaboration within research teams. This paper presents a qualitative analysis of team dynamics and learning opportunities within four social science research teams. The findings reveal similarities and differences in leadership style and interaction approaches that affected how research was undertaken and the possibilities for team members to learn from each other. The snapshots provide models for other research teams that extend situated learning theories and the existing research base about collaboration, research teams, and research leadership.

Bien que le milieu actuel de la recherche encourage la génération des connaissances par la collaboration en recherche plutôt que par les projets individuels, les universitaires ont accordé peu d'attention à la pratique collaborative au sein des équipes de recherche. Cet article présente une analyse qualitative de la dynamique des équipes et des occasions d'apprentissage au sein de quatre équipes de recherche en sciences sociales. Les résultats révèlent des ressemblances et des différences dans le style de leadership et les démarches d'interaction qui ont eu une influence sur la façon dont la recherche a été entreprise et sur les possibilités pour les membres des équipes d'apprendre l'un de l'autre. Les aperçus offrent des modèles pour d'autres équipes de recherche et contribuent aux théories de l'apprentissage contextualisé et à la base de recherche portant sur la collaboration, les équipes de recherche et le leadership en recherche.

Research and research capacity development are central to the mission of universities and are at the heart of pressures to attain and maintain global competitiveness. The emphasis on knowledge generation and mobilization has heightened demands for academics to engage in research, secure research funds, strengthen research networks, publish in top-tier journals, inform policies and practices, and advance subsequent generations of scholars. This contemporary context matters for emerging and established scholars, and for the others with whom they engage. Tenuous academic career prospects for graduate students and new academics mean these demands have become particularly acute in early career stages, which was a major impetus for *The Sage Handbook of Research Management* (Dingwall & McDonnell, 2015b), a resource tool for new scholars. However, senior academics are not immune from these demands (Larkin & Neumann, 2013; McGinn, Acker, Vander Kloet, & Wagner, 2019). Furthermore, the academic community is increasingly recognizing the importance of diversifying the racial, cultural, ethnic, and gender

composition of the research workforce and enhancing the intercultural competencies of all researchers to work with diverse others (Nielsen, Bloch, & Schiebinger, 2018; Perez, Robbins, Harris, & Montgomery, 2019). Pressures for research and research leadership are high and seem to be mounting in all facets and at all career stages within academe.

To meet these demands, research funding agencies and institutional administrators encourage research collaboration rather than individualized projects. Collaboration is presumed to be a more effective and efficient strategy to achieve knowledge breakthroughs than “lone scribes sequestered in individual offices” (McGinn, Shields, Manley-Casimir, Grundy, & Fenton, 2005, p. 562; see also Hall et al., 2018; Mensah & Enu-Kwesi, 2018). For example, the Social Sciences and Humanities Research Council of Canada (SSHRC, 2016), the (South African) National Research Foundation (2016), and UK Research and Innovation (2018) all highlight large-scale collaborations involving scholars from multiple disciplines and institutions working alongside public stakeholders and knowledge users.

Despite pressures and strategies associated with expanding the size, scope, and composition of research teams, published literature (including “scholarship of academic research,” Brew & Lucas, 2009, p. 7) provides limited consideration for the ways to make these teams work. This paper is directed at understanding what happens within social science research teams. We present an analysis of the research team dynamics and learning opportunities for social science researchers from four research teams. The paper is intended to raise awareness about the diverse ways research teams interact and the resulting influences on learning opportunities within the teams. This qualitative research study is informed by situated learning theories (Semin & Smith, 2013; Wenger, 2010) and the existing research base about collaboration, research teams, and research leadership as we describe below. These introductory sections provide the context for the later discussion of the research approach and findings.

Situated Learning Theories

We approach this work from the perspective of situated learning theories, which present learning, knowing, doing, and being as inherently intertwined social functions (Bang, 2015; Semin & Smith, 2013; Wenger, 2010). To understand what people learn or know as members of a research team involves consideration of what they do, how they engage with resources or other people, and how they perceive themselves and are perceived by others. We therefore consider participation, social interactions, and identity construction as essential to our investigations of learning opportunities and team dynamics.

Knowledge is captured in action. From a Deweyan perspective, “knowing is doing” (Wong, Pugh, & the Dewey Ideas Group at Michigan State University, 2001). Doing research is an active demonstration of research capacity (which entails knowledge, skills, attitude, and more, as per Evans, 2012); at the same time, doing research is a means to build research capacity. McGinn (2015) articulated the ways student research assistants develop as researchers as they undertake research tasks, communicate about research, and contribute to research knowledge. Likewise, experienced researchers continue to develop professionally as researchers by undertaking new research tasks, individually or collectively.

Research, like all learning, is a socially situated accomplishment. What researchers do, the others with whom they interact, and the tools or resources available all shape the research they do and the knowledge they glean. Even when research is conducted individually, it is a social practice that engages a broader community of scholars and scholarship. Research is a

conversation with the authors and ideas cited and with future audiences for the work (Bridges, 2014). These conversations are shaped by distributed communities of practice (Arthur, 2016), academic literacies (Nygaard, 2017), relational epistemologies (Bang, 2015), and affiliation networks (Rawlings & McFarland, 2011).

As researchers engage with others (directly or indirectly), their sense of themselves as researchers emerges and changes. “Identities [are] inescapably both personal and social—not only in their content, but also in the processes by which they are formed, maintained, and changed over time” (Vignoles, 2019, p. 290). Depending upon the tasks undertaken and the interactions with supervisors or other team members, students may think of themselves as learners, assistants, future colleagues, or collaborators (McGinn, 2015; Nyquist & Wulff, 1996). Through their research and interactions with others, experienced researchers may conceive of themselves as colleagues, collaborators, experts, or leaders. Identities as researchers depend not only on the ways individuals perceive themselves, but also on the ways “they are perceived and positioned by others” (Leibowitz, Ndebele, & Winberg, 2014, p. 1266). The various ways people perceive themselves and are perceived by others are intertwined with their learning. Hence, it is impossible to separate doing research, knowing research, and being a researcher. The interdependent relationships between learning, knowing, doing, and being are central to situated learning perspectives (McGinn, 2015; Wenger, 2010).

Collaboration and Research Teams

Most social science research is collaborative as evidenced by co-authorship and other stated contributions (Leahey, 2016). Empirical studies demonstrate the importance of collaboration to researchers and their research projects. A range of studies demonstrates that research projects and other creative endeavours benefit from distributed learning and the synergistic evolution of ideas within teams (Graham Bertolini, Weber, Strand, & Smith, 2019; Ritchie & Rigano, 2007; Nielsen et al., 2018). Collaboration expands funding opportunities and contributes to career advancement (Abramo, D’Angelo, & Murgia, 2014; Leahey, 2016). As well, interacting with and learning from collaborators promotes enjoyment and contributes to personal and professional development as researchers (Leibowitz et al., 2014; McGinn, 2012; Niemczyk, 2019; Ritchie & Rigano, 2007).

Despite these many positive outcomes, the move toward collaborative research also comes with new challenges in relation to ensuring effective communication, participation, and management structures (McGinn et al., 2005; Mountz, Miyares, Wright, & Bailey, 2003; Sumsion, 2014). De Saá, Diaz, Aguiar, and Ballesteros (2017) demonstrated that diversity within a research team adds skills and perspectives that contribute to knowledge production. However, team diversity may also create conflict in terms of communication and interactions between team members, leading De Saá et al. to conclude that there is a need to achieve balance with respect to the amount and type of diversity to maximize research team performance.

Collaboration entails establishing roles and expectations for each member of the group (McGinn et al., 2005). Critical studies of collaboration identify the ways that divisions of labour within research teams influence relations among team members, which in turn affect the possibilities and credit for knowledge generated (Mauthner & Doucet, 2008; Müller, 2012). Team members come with varied experience and expertise, and they may hold different academic ranks. Team members may have identified responsibilities and titles (e.g., as principal investigator or project lead, project manager, co-researcher, collaborator, assistant, technician), especially in

funded research. These formal roles may or may not align with individual or group expectations, which the team may or may not have discussed. It is essential to be mindful of the resulting effects of power and status differences (Gaughan & Bozeman, 2016; Osbakken, 2014).

Research leadership styles may vary from autocratic to laissez faire with a decided preference toward shared or democratic approaches for social science team members (Chandler, 2011). The research team members Chandler (2011) interviewed were clear that they wanted to be consulted and included, but they also preferred leaders who knew “when to end consultation and take appropriate action” (p. 189). Effective research leadership entails knowing and respecting team members’ capacities and potential contributions (Chandler, 2011; Owusu, Kalipeni, Awortwi, & Kiiru, 2017).

In the contemporary context of evident time pressures (Felt, 2017; Ylijoki, 2013; Ylijoki & Mäntylä, 2003), the time scales for collaboration are important. Collaboration promotes divisions of labour whereby different individuals may be working simultaneously on a project, which could be expected to advance a project more rapidly than individual work; however, the need to coordinate the various efforts adds substantively to project timelines. Ylijoki and Mäntylä (2003) described four competing perspectives on time that individual academics face. The permutations of competing time perspectives increase exponentially as the number of collaborators increases because each participant has an individual set of time constraints, perspectives, and priorities. Collaboration builds dependencies whereby next steps may necessitate another individual completing a different step, introducing possible sequencing challenges that could affect the overall project schedule.

Funding and reward structures encourage collaboration, yet grant application instructions and review processes may obstruct the possibilities to engage others (McGinn et al., 2019). Furthermore, the research evidence shows collaboration is not always positive. Many collaborators experience mixed reactions, identifying both pleasures and pains of collaboration (Elizabeth & Grant, 2013; McGinn, 2012). Research collaborators may experience differential benefits from collaboration depending upon status and role differences (Gaughan & Bozeman, 2016; Lee & Bozeman, 2005; Osbakken, 2014), yet VanLandingham (2015) identified mutual benefit as key to “durable and successful teams” (p. 328). Macfarlane’s (2017) moral continuum of collaboration shows a range of possibilities for interaction. There may also be uncomfortable tensions between collaboration and competition (van den Besselaar, Hemlin, & van der Weijden, 2012).

There is a distinct need to understand the functioning of social science research teams to advance knowledge and support research capacity development. Given the focus on the practice of collaboration within research teams, this study offers valuable insight about similarities and differences in leadership styles, interaction approaches that affect how research is undertaken, and possibilities for team members to learn from each other. As described in this section, collaborative research has the potential to provide many positive outcomes, yet it may also bring challenges that can be disruptive.

Research Methods

We secured institutional ethics clearance and then recruited four social science research teams to participate in the study. The main data sources were observational fieldnotes recorded over several months during and immediately following the teams’ meetings and research fieldwork. We audiotaped and transcribed the research team meetings when possible, paying careful

attention to cause as little disruption to the teams' work as possible. Observations during teams' research fieldwork were undertaken only after careful consideration of the ethical implications for the participants in the research projects conducted by the four research teams.

Team dynamics questionnaires provided a second key data source. Members of all four research teams were invited to complete a brief questionnaire consisting of the following six questions:

1. How would you describe this team?
2. What roles do you fulfill in the team?
3. What agreements have you made about how you will work together as a team?
4. How would you describe your most valuable learning experiences as a member of this team?
5. What are the biggest challenges you have faced in this team and how have they been resolved?
6. Are there any other comments that you would like to provide about your experiences as a member of this team?

We supplemented the observational data and team dynamics questionnaires with informal interviews, conversations, and written reflections from research team members. In addition, some teams shared select email communications and research documentation that became part of the research database. Triangulating across all the data sources provided a rich data set.

Consistent with recommendations for team-based qualitative analysis from MacQueen, McLellan-Lemal, Bartholow, and Milstein (2008), we worked together as a research team to review all data sources, write individual case reports for each research team, and identify themes and illustrative quotations. We reviewed each case report as a group to locate important segments of data. After coding all cases, we identified comparable codes, which were then grouped into a manageable set of themes. The multi-step analysis led us to four central themes that characterize key similarities and differences across the four teams: leadership and research team dynamics, collaboration agreements, learning opportunities within research teams, and challenges and frustrations.

For the purpose of transparency and credibility for our interpretation of data, we provide carefully selected quotations from participants (Roller & Lavrakas, 2015). We were, however, mindful to maintain a balance between our interpretations and quotations. As indicated by Morrow (2005), "an overemphasis on the researcher's interpretations at the cost of participant quotes will leave the reader in doubt as to just where the interpretations came from [and] an excess of quotes will cause the reader to become lost in the morass of stories" (p. 256).

Before discussing the four themes in full, we first introduce the four research teams to provide context for our analyses.

Participating Research Teams

There is considerable variability in the ways these social science research teams organized themselves. The four selected teams varied in size from 2 to 12 participants, representing small-scale projects (e.g., one individual academic working with one graduate student) through medium-scale projects (e.g., a group of academics, students, and community members collaborating at one location). No large-scale projects (e.g., nationally or internationally funded

research projects involving multiple sites and disciplines) are included in the present analysis.

Participants across the four research teams included Assistant, Associate, and Full Professors; high school, bachelor's, master's, and doctoral students; professional, technical, and administrative staff; and community members. Consistent with the norms of social science research teams in Canada (Acker, Wagner, & McGinn, 2018), all teams included at least one graduate student and at least one professor. There was about 50-years difference between the oldest and the youngest participant, with representation from the Silent Generation through to the Millennium Generation (Strauss & Howe, 1991).

Some teams were purposefully organized to include cultural, disciplinary, and methodological diversity whereas other teams were more homogeneous. We adopt cultural identity labels consistent with terminology used within the individual teams, while acknowledging that the range of possible identity categories and positions is broad, multifaceted, constructed, intersectional, and informed by context (Booyesen, 2019; Vignoles, 2019).

Confidentiality considerations necessitate care in describing the research teams and team members. These introductions provide brief glimpses to contextualize the discussions that follow about team dynamics and learning opportunities.

Research Team 1 consisted of two Euro-Canadian women: a master's student and an early mid-career professor. Likewise, their research participants were graduate students and professors, most of whom were also Euro-Canadian. The master's student applied for a position as a research assistant in order to develop skills in collecting and analyzing qualitative research data as preparation for her thesis on an unrelated topic. Over an 8-month period, the student and professor met weekly, planned data collection and participant recruitment, sought ethics clearance, conducted interviews, analyzed interviews, wrote a conference proposal and then paper, presented at a conference, and prepared a manuscript for publication. (For more information, see McGinn, Niemczyk, & Saudelli, 2013.)

Research Team 2 brought together a central core of three Euro-Canadian professors (two early and one late career) and two Euro-Canadian graduate students (one master's and one doctoral), with other assistants of various cultural backgrounds fulfilling supportive roles (mostly interview transcription) at different points in the team's work. The central core included four women and one man. One student member of the core team required accommodations for a disability. The gender breakdown and career range within the team mirrored that for their research participants, but not the racial and ethnocultural mix. The professors conducted all interviews outside the team due to their personal connections with interview participants. The project integrated three qualitative research approaches, reflecting the three professors' areas of expertise; a fourth qualitative research element was added to incorporate expertise from the master's student. The five core team members functioned in a collaborative manner, engaging fully in research design, analysis, and writing tasks. Initially the five team members met monthly, then shifted to irregular meeting schedules in the final writing phases.

Research Team 3 comprised four professors (early and mid-career from four different departments across two universities) and two research assistants (a master's student from one department and a recent master's graduate from a different department at the same institution). Half were men and half were women. The team had four Asian or Asian-Canadian researchers (the principal investigator, one co-researcher, and both research assistants) and two Euro-Canadians (the other two co-researchers). The Asian and Asian-Canadian team members were bilingual and had bicultural experience in Asia and Canada; these team members provided cultural expertise regarding the tensions between Eastern and Western beliefs that were the focus

of their study of Asian-Canadians. For this mixed methods study, one co-researcher was recruited specifically for qualitative research expertise and one for quantitative research expertise. Research team meetings for the professors involved teleconferences and email communication during the research design phase. One professor (the principal investigator) and the two research assistants (all Asian or Asian-Canadian) were responsible for data collection. They met weekly to discuss research design and data collection, and to ensure the research assistants had sufficient training for their tasks. The other professors (co-researchers) were slated to be involved again during data analysis, report writing, and (for two of the three) supervision of the master's thesis that would be based upon data from the project.

Research Team 4 had 12 participants, an even mix of individuals who identified as Indigenous and those who did not, including two graduate students and one completing high school credentials, as well as tenured and untenured professors, four community-focused staff members (some of whom were completing undergraduate or graduate degrees), and one community member (a recognized Elder). There were six men (the four named grant holders and the two identified Indigenous leaders) and six women (none of whom were identified in leadership roles in the team). Their research program involved Indigenous peoples and Indigenous research methods. Some research team members had prior Indigenous research experience. All team members were encouraged to participate in research design decisions, data collection and analysis, and report writing. Preliminary data analyses were conducted in a group setting to allow all team members to contribute, and then two professors took responsibility for fine-grained analyses and first drafts of research papers.

All of the teams continued to work together after our data-collection periods ended, so the following snapshots cannot show all aspects of team functioning over time. Teams and team functioning are not static; they may evolve and change over the life of a project (Kozlowski, 2015). Team members may come and go from a project, introducing new elements to the team dynamics. The research cycle itself also unfolds, providing evolving challenges and accomplishments. Team members transform, the research project transforms, and the team as an entity transforms.

Leadership and Research Team Dynamics

Each research team presented itself as collaborative and described the importance of valuing diversity within their team. In each team, participants brought individual goals, strengths, concerns, and personalities to the research, which were given divergent amounts of space to influence the research team and the research project.

Within the teams, the tasks associated with research design, literature review, grant writing, ethics clearance, equipment purchases, participant recruitment, data collection, data analysis, report writing, conference presentations, visual representations, file organization, meeting logistics, and financial management were distributed among different team members, with some team members involved in a broader range of tasks than other team members. In pursuing these various tasks, some teams functioned collaboratively, whereas hierarchies and role distinctions were evident at some points in other teams' work. Likewise, there were distinctions in the ways that leadership and decision making were centralized or distributed across the research teams.

During the data-collection period, Research Team 3 could be described as having the simplest leadership structure because the principal investigator was the one clear leader. He coordinated the project, solved the problems, addressed logistics, and decided when to call upon other team members. He was the central node in the research team and was involved in every step. The other

team members were clearly positioned and defined themselves as collaborators and assistants. As one research assistant explained, “We meet once a week; during which time I report my work and ask questions.” The principal investigator enacted different types of leadership with co-researchers than with research assistants. According to the leadership types identified by Owusu et al. (2017), the principal investigator’s focus on work tasks and monitoring task accomplishments for the research assistants is best characterized as a task-orientated leadership style. This task focus was less obvious in his interactions with the co-researchers and, on the surface, he projected a somewhat *laissez-faire* approach to leadership with them. It seemed, however, that his concern continued to be with getting the work done, but without the concomitant focus on pre-defining the work and roles necessary to complete the tasks. One collaborator requested such guidance on multiple occasions: “what is it you want me to do?” and “where [do] you want to take the manuscript next?” Responses to these questions sometimes involved consultation with other team members, but the principal investigator always documented the final decision in writing for all team members.

Somewhat in contrast to Research Team 3, leadership roles in the other three teams were more distributed or participative (Chandler, 2011; Owusu et al., 2017). In Research Team 1, the student was engaged in research for the first time, so the professor was naturally the leader in beginning phases of the work, but the student built competence and confidence over time, and eventually began to take more initiative and contribute more equitably to directing the project. In the recordings from the later meetings, it was not obvious who was the professor and who was the student because both contributed substantive content (McGinn et al., 2013). A comparable emergent process was evident in Research Team 2, where the three professors shared leadership equally during the early phases of the project, and the students came to contribute in more substantive ways as the project unfolded, including lead authorship for some analyses. Research Team 3 was still in the early stages of data analysis, so similar developments or transitions could have occurred after our data collection ended; however, we do not anticipate a comparable shift toward equal contributions because such a change would be somewhat inconsistent with the task focus of the principal investigator and the minimal engagement of the co-researchers. Furthermore, it appeared that the research project was not well integrated with the co-researchers’ existing research programs; one co-researcher described “exploring a new area which is very interesting.”

Research Team 1 and Research Team 2 were moving toward democratic participation, but the concerted attention to the students’ development in both teams might best be characterized as people- or relations-orientated leadership (Owusu et al., 2017). The professors in both teams paid clear attention to the development of the student researchers and of the collaborative teams as a whole. On one level, it seemed that doing collaboration well was almost more important than attending to their research tasks; however, each of their research projects were about relationships among scholars, so attending to good collaboration really was attending to their research projects.

Research Team 4 had the most complex team structure with different forms of leadership distributed throughout the team. Two team members were named grant holders and identified as lead researchers. They took responsibility for finalizing data analyses and writing drafts of the research papers after a series of data analysis meetings with the whole team. They could be considered the kind of functional collaborative experts that Chandler (2011) recommended for social science research teams. However, throughout the team meetings and in the subsequent individual writing, these two lead researchers, who were not Indigenous, relied heavily upon the

expertise of two Indigenous team members: one community-focused staff member completing a doctorate and one Elder, neither of whom were named grant holders. These two Indigenous researchers served as important cultural teachers within the situated learning context of their team. As one of them reported, “I guess you might consider me the guide between two cultures, bringing the [non-Indigenous] researcher[s] into our community and bridging the gap through ongoing explanation.” The two lead researchers and these two Indigenous researchers provided complementary forms of leadership and expertise that were essential to the research project to meet the funding and research ethics expectations and to access knowledge essential to their project.

Research Team 3 and Research Team 4 were each conducting studies about research participants’ efforts to balance their cultural traditions and epistemologies against dominant Western perspectives. Research Team 3 focused on Eastern epistemologies whereas Research Team 4 focused on Indigenous epistemologies. Both teams foregrounded bicultural and bi-epistemic understandings. A major difference between the two teams, however, was that the formal leader and named grant holder in Research Team 3 held this bicultural expertise whereas one strand of leaders (not named grant holders) held this expertise in Research Team 4. For Research Team 4, eligibility requirements for the grant prevented the Indigenous scholars from being named as grant holders and thereby probably undermined the funders’ own commitments to Indigenous research leadership and certainly affected the power dynamics within the team.

Research Team 4 was striving toward democratic and participative leadership, but looming deadlines prompted the named grant holders to shift toward a more task-orientated style to get work accomplished within time and budget constraints. The principal investigator explained,

Given how hurried everyone’s professional lives are, it has been difficult soliciting peoples’ feedback to various initiatives (manuscripts, further data collection, and related projects, to name a few). Last, and I would assume this is a challenge that is common to most research teams and certainly to mine, we are faced with having to conduct research with limited funding. In other words, we have been forced to revise our research plan and limit the number of participants due to the cost of transporting them to the research site.

There was potential for this transition to lead to later conflict between the two strands of leaders represented by the named grant holders and the two Indigenous researchers who provided cultural leadership. The Indigenous leaders agreed to the transition but signalled indirectly that they intended to monitor the situation in case changes were needed. Even after the two lead researchers took over drafting papers, the team kept their “commitment to share all written products from the research project with all members of the team before the manuscripts [were] submitted.” It is noteworthy, however, that they had established limits on the review time frame as noted in the message that accompanied one draft paper when it was distributed to the team: “It is our recollection that an understanding was established, as part of this agreement to share our work, that any and all comments be forwarded within a 48 hour period.” As outside observers, it is difficult not to question the appropriateness of this short timeline, especially for Indigenous research (see Absolon & Dion, 2017), but we heard no concerns raised by team members and respect that research teams make choices that work for them.

The various leadership structures related to the roles, responsibilities, and positioning of the leaders and others within the research teams, and thereby influenced the tasks team members undertook, the interactions they had with each other, and the ways they saw themselves and

others within the teams. Leadership structures also affected the division of labour, data access, and credit for team members, which are key considerations that often lead to tensions within research teams (McGinn et al., 2005; Muhammad et al., 2015; Osbakken, 2014).

Collaboration Agreements

To support and sustain positive team functioning, each team had various conversations about their collaborative processes and the expectations for individual team members. On the whole, the team members described their processes as collaborative, equitable, and enjoyable. The following quotations accurately reflect the voices from all four teams:

I enjoy the relaxed but supportive relationship (in both ways) that I have established with [the others]. (Research Team 3)

Diverse—rich perspectives, particularly from Aboriginal researchers, who add tremendously to our ability to make sense of experiences in the data. Collaborative—in the field research and coding, everyone very active and fairly equal. Fun—we enjoy each other’s company. (Research Team 4)

Two teams had formalized their expectations through written agreements. During early team meetings, Research Team 2 spent considerable time collectively articulating their beliefs, values, and concerns regarding collaboration, student supervision, intellectual property rights, and authorship of documents for their research project. Each of the professors indicated that they had experienced or witnessed negative team interactions, which they wanted to avoid. Over several meetings and email exchanges, the team crafted a detailed set of principles, which they formally signed and filed with their institution’s research office, thereby creating a reference document to gauge their interactions and define expectations for decision making and conflict resolution. The team returned to this set of principles when questions arose within the team and they claimed that their proactive approach meant that they never needed to resort to the conflict-management strategies identified in their written principles.

Members of Research Team 4 also discussed and prepared a set of principles for their team, which was intended to shape the entire project in a mutually respectful manner. Similar to Research Team 2’s principles, this agreement addressed issues of collaboration, authorship, and intellectual property issues. In addition, the agreement included information regarding Indigenous cultural traditions, beliefs, knowledge, and ceremonial protocols that they identified as essential to the positive functioning of their bicultural and bi-epistemic team. This cultural information supported the team to align their practices with ethical guidelines for research involving Indigenous peoples (Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council of Canada, & SSHRC, 2018, Chapter 9). In this way, the agreement served an educative function to foster the intercultural competence necessary to function within their team and undertake research with Indigenous peoples. This education was an important way for the team to meet the research funder’s expectation that all funded projects enhance capacity across the social sciences and humanities research community to engage with traditional Indigenous perspectives.

No comparable written agreements were produced in either Research Team 1 or Research Team 3; these teams relied upon verbal agreements and sometimes unstated assumptions. In Research Team 1, the student was new to research and listened to the professor’s description of how the research would unfold. From the first meeting, the professor explained that she expected

they would work in a fully collaborative fashion and that she was committed to providing support to assist the student to engage in all activities of the project, and to respecting the student's need to develop skills and confidence for engaging in the research. The professor presented herself as a partner or "companion researcher" (Nicolas, 2008, p. 11). Despite these explanations, the student initially thought she would have a lesser role in the project:

I guess at the beginning stage I really was unsure of what my value to this [project] could be. And I was thinking that my value would probably be more as a transcriptionist or doing sort of the background work involved.

Over time, the student came to see herself as a partner in the process, and began using the pronouns "we" and "our" in her journal and in research team meetings from the research project rather than treating it as the professor's work. As part of their conversations, the professor explained principles and strategies for determining authorship, and provided relevant resources (e.g., Albert & Wager, 2003; Bourbonniere, Russell, & Goldsmith, 2006; International Committee of Medical Journal Editors, 2019). The two team members readily agreed that the professor should be first author and the student second author on the conference paper and subsequent manuscript for submission to a journal.

In Research Team 3, the principal investigator negotiated agreements with each team member. The research assistants were informed about their responsibilities within the project and they signed employment contracts that identified those responsibilities. In contrast, the expectations for the co-researchers were much lighter and less formalized. The principal investigator asked them to devote one day per month to the project but called upon them for support only when needed and did not apply pressure. Three manuscripts were planned from the project with all team members expected to serve as co-authors; the principal investigator and two of the three co-researchers served as the supervisory committee for the master's thesis to be written from the project data.

Whether documented formally or not, it is critical for research teams to openly discuss roles and expectations to minimize problems within any team (VanLandingham, 2015). It is fairly common practice to recognize that collaborators should discuss intellectual property rights and authorship credit, and such considerations are now written into many institutional policies (Herder & Holloway, 2015; Secretariat on Responsible Conduct of Research, 2016). The experiences of the four research teams suggest that such conversations should extend beyond authorship and intellectual property to consider leadership structures, team members' roles, and group expectations to ensure productivity toward shared goals (McGinn et al., 2005). As Dingwall and McDonnell (2015a) concluded, successful research collaboration requires frank conversation about all these topics early in the process to circumvent later problems.

Learning Opportunities Within Research Teams

Within the context provided by the team dynamics and collaboration agreements, members from each of the research teams described their work as a tremendous learning experience, including advancing their understandings about their research topics, developing new methodological approaches, improving research skills, enhancing intercultural competence, coming to know other researchers, and strengthening collaboration skills. The voices of two Research Team 4 members represented it well: "I learn best when bouncing ideas off other people and learning

from their ideas” and “the best part of being a part of this research team is that I am continuously learning.” In group settings, it is possible to learn from what others know and to learn how to capitalize on the complementary strengths within a team.

Within these research teams, the extent of the learning was particularly evident for the students and other newcomers to research because their emerging research skills and increased confidence as researchers contrasted with the limited research backgrounds with which most began these research projects. The funding sources for each team included expectations that the research projects would provide training opportunities for the next generation of scholars. At some points, professors provided direct, didactic instruction in particular research skills (cf. Grenville & Ciuffetelli Parker, 2013; McGinn et al., 2013); more frequently, the new researchers learned through tacit means by observing, engaging, and absorbing the work of the more experienced researchers (cf. Hasrati, 2005; Wegener & Tanggaard, 2013). Through explicit and implicit means, the professors seemed to be responding to the call that “educational researchers should ensure that research assistantships be educative” (Strike et al., 2002, p. 152).

As the student in Research Team 1 explained, the professor “envisioned her role ... as one of mentoring me through the process. Consequently, she guided me through a qualitative research study, as opposed to assigning me mundane tasks that would provide little knowledge regarding the research process.” The student read the literature, discussed the research idea, conceptualized the project, identified prospective participants, designed research instruments, pilot tested procedures, recruited participants, collected interviews, organized files, coded data, assessed data in light of research questions, co-authored a paper, edited the paper, presented at an academic conference, responded to feedback, and networked with other scholars (i.e., all activities included in Hershey, Wilson, and Mitchell-Copeland’s, 1996, “expert research script”). Through this process, the student advanced from a complete novice to an emerging researcher, confident to begin her own independent research project and committed to pursuing further graduate study and an academic career (McGinn et al., 2013). A similar approach was adopted in Research Team 2 and Research Team 4 to ensure the students were involved in all phases of the research from design to interpretation to presentation.

The principal investigator in Research Team 3 defined one of his central roles as training the research assistants. He met weekly with the two research assistants to instruct them in research skills, provide feedback on their work, respond to any questions they had, and ensure they were working productively together. The research assistants were learning research skills as they also learned about the research topic (cf. McGinn et al., 2013). Both research assistants were also invited to attend a research presentation that the principal investigator gave where he introduced them to the audience, and they contributed in small ways to the conversation. Building from these developmental sessions, the research assistants were poised to contribute positively to the research project as it unfolded over time.

The projects undertaken by Research Team 1 and Research Team 2 were nearing completion with both teams having presented and written findings from their research projects. At that stage in the process, the students involved in these teams characterized themselves as researchers and scholars, not just research assistants or research students. Consistent with situated learning theories, this development of a sense of themselves as researchers is a key indicator of their learning (McGinn, 2015; cf. Wenger, 2010).

Learning and development within the research teams were not limited to the newcomers but extended to more experienced researchers. As McGinn (2006) argued, “learning and development as a researcher does not end upon completion of graduate or postgraduate study Skills and

identities as researchers are not static; there is continual evolution over career and life spans” (pp. 134–135). As one of the professors in Research Team 4 reported, “There is a continuous learning process being a member of this team; learning about culture and traditions of Aboriginal people and learning about the nature of group dynamics.”

The composition of Research Team 4 was highly complex and diverse, as were the team members’ learning needs. All team members were attuned to the need to understand and incorporate Indigenous traditions and cultural practices into their research process but had different baseline understandings of what this might entail. The funding program and ethics guidelines demanded a commitment to Indigenous research capacity building (Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council of Canada, & SSHRC, 2018, articles 9.13, 9.14), which had informed decisions around team composition. The student team members and the untenured professors were also attuned to furthering their academic careers. At times, these needs converged with the needs of other team members, thereby promoting collaboration to achieve common goals through writing and presenting the research. The project was in process when we concluded our interactions with the team, but further development was keenly anticipated.

In all teams, the learning opportunities for team members were related to what they did, the others with whom they interacted, and the ways they perceived themselves and the others around them. Learning within the teams was evidently a socially situated accomplishment (Bang, 2015; Semin & Smith, 2013; Wenger, 2010).

Challenges and Frustrations

Despite very positive experiences within the research teams, there were some challenges and frustrations evident at various points. In the current research context, it is not surprising that time was a major challenge for the research teams (cf. Acker, 2017; Ylijoki, 2013; Ylijoki & Mäntylä, 2003). One member of Research Team 4 expressed the sentiments of many when he quipped, “We should have 25 hours a day and 8 days per week.” There is always more work than the time or funding seems to allow. In Research Team 1, the time issues were relatively well managed due to the size of the team and of the project (i.e., two people conducting interviews with 16 people). Together, the two team members committed to regular weekly meetings and progressed at a pace consistent with the funding time period and the upcoming conference deadline. The professor’s stated commitment to ensuring educational opportunities for the research assistant meant that some tasks were delayed, as for example in the final preparations related to the application for ethics review:

We didn’t have a face-to-face meeting, we said, “Okay, well we should get this done, hurry up and get this into the ethics board. And okay we need this description of the procedures I’ll just sit down and write that.” Well wait a second, you know, that doesn’t help you to get it and it takes it away from you. So, you know, we can wait, it’s okay if it’s, you know, another week and we sit down together when we can work through it together.

It is true that experienced researchers can complete some research tasks more efficiently on their own than by collaborating with a graduate student or another new researcher who requires mentoring or training (Acker et al., 2018; Lee & Bozeman, 2005). Nonetheless, there was considerable consensus from Research Team 1 that the benefits outweighed drawbacks or

potential concerns around delays.

Timing concerns resurfaced for Research Team 1 after the conference was over and the funding period ended. At that point, other obligations and commitments surfaced that interfered with the regular meeting schedule and interrupted the momentum required to refine the conference paper for submission to a journal. The same is true for Research Team 2 who had not yet finished their final manuscript despite the fact their funding had expired and team members had moved on to other projects, making it difficult to carve out the necessary time to complete their shared work, especially with no financial support for the final phase. These are examples of process time extending beyond project time (Ylijoki, 2015).

Timing challenges are particularly complex with larger teams such as Research Team 4. Trying to schedule regular meetings with the whole team and to provide opportunities for everyone to respond to the work as it unfolded were major challenges. As one team member wrote, “I would say that coordinating the schedules of such a large number of team members has been a very difficult task.” These timing challenges prompted the team to revise their initial plan to complete all data analyses as a group, and instead two team members planned to build from the initial group analyses to complete fine-grained analyses and write first drafts of research papers to be distributed to all team members for input. This strategy significantly cut back on the challenges of coordinating group meetings and allowed the two team members to work at their own paces in light of their personal schedules. The strategy also addressed the dwindling research funds and the need to pay research assistants and community members for their time on the project. However, the strategy reinforced existing divides within the team because the two writers were non-Indigenous and it contradicts the advice from other scholars (e.g., Absolon & Dion, 2017). Although Indigenous and non-Indigenous team members expressed optimism about this process, it was not clear how this transition in the team’s approach would be received over time and how smoothly any disagreements might be resolved.

The work of Research Team 4 needed to represent two distinct cultural and epistemic traditions. Key distinctions between project time and process time (Ylijoki, 2015) were evident in one team member’s comment: “The deadlines so common to [grant] funding, publishing, etc. do not lend themselves to the time frames common to Aboriginal research needs.” Working across cultural lines required patience, open minds, and a commitment to negotiate the process as it unfolded (cf. Absolon & Dion, 2017). These navigations represented both the greatest learning opportunity and the biggest challenge for the research team members. As one team member explained, “I am learning how challenging it is to authentically engage in this type of bi-epistemic research.” The need for continual negotiation and explanations across the two cultures seemed frustrating at times. It is important to note that although team members came from different epistemic traditions, they were open to learn and acknowledge different ways of knowing and doing, which is an important marker of intercultural competence. The challenges of working within a bicultural and bi-epistemic research environment were also present in Research Team 3 as they negotiated between Eastern and Western traditions.

Whether within or across cultures, the research teams also questioned if team members’ contributions were equitable and upheld all commitments made to the project. Macfarlane (2017) raised this same issue in his analysis of the moral continuum for collaboration. As one Research Team 4 member indicated,

while all researchers have contributed significantly to the research process, it seems that not all will contribute significantly to the writing of academic papers. This raises some issues, as production is key

to the academic credibility with [the funding agency] and the wider community of the educational researchers.

Within a research team, scholarly productivity may be dependent upon the contributions of all team members. In many cases, if one person does not complete a necessary task, then the others must wait for it to be completed. As international guidelines confirm (International Committee of Medical Journal Editors, 2019), all authors must agree to the form and content of any manuscript submitted under their names, so there must be time and opportunity for all to respond, even when that means facing a “drag on the[ir] productivity” (Lee & Bozeman, 2005, p. 674) as they wait for a slower or overworked collaborator.

The formal agreements generated by Research Team 2 and Research Team 4 explicitly described expectations around participation and commitments to the project. These agreements also included stipulations about conflict resolution and mediation. In Research Team 3, the principal investigator scheduled one meeting per month for the research assistants to express criticisms, concerns, and anything that was undesirable about the research. These meetings were intended to provide a space to address frustrations and seek resolution without allowing these issues to take over too much space within the team. Devoting some time to process talk appeared to be important for successful collaboration, thereby affirming recommendations from other scholars (Absolon & Dion, 2017; Dingwall & McDonnell, 2015a).

Conclusions

With the increasing pressures for all academics to be researchers and contribute to research capacity within and beyond their individual settings (Evans, 2012; Kyvik, 2013; Müller, 2014), it is important to consider the implications that can be drawn from day-to-day interactions observed within research teams. Greater awareness about different ways of interacting with team members may help all researchers to consider suitable approaches to adopt in a given situation (Ritchie & Rigano, 2007). Such awareness may provide models for individual researchers to reconsider typical habits and experiment with different team structures. It may also provide ways for scholars to ensure they are contributing positively to the development of a next generation of scholars. That is, it may promote more collaboration as mentorship than collaboration as parasitism or cronyism (Macfarlane, 2017).

The snapshots we have presented show similarities and differences in research team functioning across phases of particular projects. Situated learning theories drew our attention to participation, social interactions, and identity construction in our efforts to understand what was happening in these social science research teams. We noted differences in leadership style and interaction approaches that affected how research was undertaken and the possibilities for team members to learn from and teach each other.

Overall, the opportunities to collaborate and learn together in respectful and inclusive environments were positive experiences for members of each of these teams. There were some tensions and challenges within each team, but the pleasures and opportunities seemed to outweigh these pains, even for Research Team 4 who faced difficult bi-epistemic challenges that were compounded by the complexity of two distinct leadership strands and time pressures.

It is important to note, however, that not all teams function as positively as those documented here (Macfarlane, 2017). We assume there was some degree of self-selection bias involved in the four teams represented in this work. Each team agreed to participate in this study knowing there

would be observers documenting their team functioning. Teams who were unhappy with their team dynamics or unwilling to reflect upon their team dynamics probably would not volunteer to participate in this research. Furthermore, Research Team 2 and Research Team 4 both described their decisions to create written principles as a strong desire to ensure positive functioning within their teams and to contribute to research capacity development through their projects. As explained, members of Research Team 2 framed these decisions in light of negative team dynamics they had experienced or witnessed in other contexts.

Each of the teams involved in this study had at least one student member, which is typical for social science research teams in Canada (Acker et al., 2018). There are pragmatic, educational, and financial reasons for students to engage in research assistantships during their studies (McGinn, 2015). Student research assistants learn research skills and earn some money (Niemczyk, 2019). Researchers who supervise student research assistants have access to a ready pool of well-educated and often modestly compensated assistants who devote time and effort to complete research tasks. Supervision of research assistants is embedded in the work of the project, so student research assistants learn the required research skills without adding more tasks to busy researchers' schedules (McGinn et al., 2013).

Beyond the engagement of students, Research Team 4 also included community members. Considerations about the development of subsequent generations of scholars can and should be extended to include attention to research capacity development within communities. Such considerations are particularly true when those community members come from groups who have been mistreated historically by research and under-represented as researchers, such as the Indigenous communities that are central to Research Team 4 (Smith, 2012). Canada's guidelines for research involving Indigenous peoples include an expectation that research in Indigenous contexts or about Indigenous peoples will support research capacity building for Indigenous peoples (Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council of Canada, & SSHRC, 2018, article 9.14). Other scholars have advocated for inclusion of "insiders" in research focused upon other marginalized or stigmatized groups (e.g., Kellett, 2011; Peuravaara, 2015; see also Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council of Canada, & SSHRC, 2018, article 2.11) and attention to power dynamics within teams from heterogeneous backgrounds (Muhammad et al., 2015; Osbakken, 2014; Walsh, Brugha, & Byrne, 2016).

Intercultural competence was essential to interactions within Research Team 3 and Research Team 4, and to their interpretations of the culturally laden research data they collected. Their research projects relied directly upon the bicultural and bi-epistemic composition of their teams. In contrast, Research Team 2 collected data regarding racial and cultural issues without comparable personal experience to draw upon within the team. Their analyses relied upon engagement with the literature and some references toward personal experiences of other forms of marginalization (related to gender and disability). With or without comparable personal experience, the success of all the research projects demanded high levels of intercultural competence, which as Niemczyk (2018) has argued, is critical for globally competent researchers.

In the two bicultural and bi-epistemic teams (Research Team 3 and Research Team 4), certain team members took primary responsibility for explaining cultural and epistemic differences relevant to their research projects and their team functioning. These individuals served as cultural teachers for others within their teams and, by extension, for the audiences of their research work. Racialized scholars often carry heavy burdens for this kind of work, which is a form of "cultural taxation" that is seldom recognized in funding eligibility allowances, workload allocations, or

promotion criteria (Joseph & Hirshfield, 2011; Louie, 2019). These burdens were most prevalent in Research Team 4 where the responsibility fell to scholars who were not well positioned to receive academic prestige or promotion for the work because they did not hold academic appointments and were not named grant holders. Within the hierarchical structure of Research Team 3, the burden seemed more manageable because the principal investigator carried the weight and would receive the most credit for the work undertaken.

No matter how successful the four research teams were in contributing to the development of new researchers, it is evident that the environment of the academy is not always conducive to hands-on research mentoring as Hinchey and Kimmel (2000), Macfarlane (2017), and other scholars have argued. Professors' willingness and abilities to allocate time for the type of close mentoring evident in these research teams can become compressed through the pressures of funding proposals, publishing expectations, conference deadlines, promotion and tenure considerations, and other realities of a hectic academic career (Acker et al., 2018; Lee & Bozeman, 2005), including the overburden faced by those who experience cultural taxation and possibly resultant burnout (Ezell Sheets, Barnhardt, Phillips, & Valdés, 2018). For example, the time crunch that Research Team 4 experienced led to their decision to shift away from team members working side by side.

Another critical factor that may affect the willingness and ability of professors to devote the time necessary to support this type of team functioning is academic career stage. The demands of establishing an academic career and securing tenure may mean that it is too much to expect early career academics to fully commit to such approaches. This was evident in the story of one professor that McGinn and Lovering (2009) interviewed:

When I was first hired as a university professor and didn't have tenure, I didn't think about training graduate students. I thought about getting tenure. So it wasn't so much, what I can do for the people who I've employed, but what they can do for me in terms of facilitating my research so that I can get tenure. Now, from the vantage point of having been around more years, I'm more aware of looking at it from the point of view of what I can do for them rather than what they can do for me. So I would say over the last few years ... I am trying to design [funded research projects] being more attentive to what kind of learning experiences would be useful and fruitful for the graduate students to have that in some ways also jive with, you know, what would further the whole project. (p. 9)

Beyond settling into an academic career, there is another important element, particularly evident in Research Team 1, that can influence student research assistant growth. Experienced researchers must be attentive and responsive to the needs and emergent capacities of novice researchers. Within Research Team 1, the professor and student co-created a space in which the complexity of the student's new identity as a "researcher-in-the-making" (Nicolas, 2008, p. 10) could be tested in a guided and supportive environment. Consistent with scaffolded learning, the professor provided the student with continual opportunities to grow that were just beyond her current developmental level. As the student's capacity and confidence increased, the teacher-student relationship shifted to a relationship among equals (see McGinn et al., 2013). This kind of one-on-one targeted support may be challenging as the size of the group expands. Such interrelations are not only dependent upon the commitment of professors or experienced researchers, but also dependent upon the initiative and commitment shown by students or other new researchers. These newcomers must be dedicated collaborators who welcome the opportunities made available in the context of their research work.

To date, studies of researcher development have concentrated on opportunities for students to learn research skills and develop self-confidence as researchers by working alongside experienced researchers (e.g., Maher, Gilmore, Feldon, & Davis, 2013; McGinn et al., 2013; Wegener & Tanggaard, 2013). Scant research attention has been devoted to learning opportunities for community members (although, see Kestenbaum et al., 2015) or for individuals at subsequent stages of an academic career cycle. Researchers engage in continual development as they encounter career and life cycle changes, interact with other individuals, and explore new research areas. Such development seems to have become particularly salient in the current research climate where new policies and pressures are shaping academic work, practices, careers, and identities (Wilson & Holligan, 2013; Ylijoki, 2013). We strive to identify interventions, policies, and practices to ensure that pleasures continue to outweigh pains for a broad range of researchers.

We encourage researchers to reflect upon the structures and patterns of their team interactions, and to contemplate changes that could enhance their research and their research teams. We realize that the possibilities to make changes may differ for researchers who hold different team roles (e.g., principal investigator, research leader, newcomer assistant). Our hope is that richer understandings of social science research team functioning can support all researchers to work respectfully with others and capitalize on the possibilities for themselves, their collaborators, and their research teams.

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Michelle K. McGinn is Associate Vice-President Research and Professor of Education at Brock University. Her primary interests relate to research collaboration, researcher development, scholarly writing, and ethics in academic practice. She is a co-investigator on the Academic Researchers in Challenging Times project (see <https://arictproject.com/>).

Professor Ewelina K. Niemczyk has experience in a variety of teaching and research positions in Canadian and South African contexts. Her scholarly work focuses on research education and research practice, higher education for sustainable development, as well as education in BRICS (Brazil, Russia, India, China and South Africa) countries. In terms of the former, Prof. Niemczyk explores current research realities associated with the demands of research productivity and researcher development. The line of research across the BRICS member states examines educational practices that can be shared to maximize quality of education. As a President of the BRICSEd Association—under the BRICS@NWU, she is dedicated to promote academic excellence across the BRICS countries and beyond. Professor Niemczyk’s scholarly interests are reinforced through the modules she teaches at North-West University in International and Comparative Education as well as her publications. As per contribution to the scholarly community, she actively serves as a journal and conference reviewer; book editor; conference chair; and keynote speaker.