Information and Communications Technologies (ICT) in Program Evaluation Practice:

Exploring New Pathways to Evaluation Use

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Thesis submitted to the University of Ottawa
in partial fulfillment of the requirements for the PhD in Education

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Abstract

Despite the growing importance of information and communication technologies (ICTs), their use in the field of program evaluation has been, to date, understudied. Using a mixed-method approach and a conceptual framework informed by social interdependence theory, this thesis sought to contribute to this area of research by exploring how evaluation practitioners engage with ICTs, and if and how this influences evaluation use. The comprised two parts are in a cascade design: a qualitative study relied on interviews with practitioners, followed by a quantitative study utilizing a survey instrument to obtain findings from a larger cohort of practitioner respondents. The findings from both studies revealed that ICTs' value is greater for the use of evaluative results (findings use) than for benefits arising from evaluation processes (process use), and that these tools support evaluation activities by aiding background and foreground processes. When used in the background, ICTs can help evaluators by offering flexibility, improving speed, and efficiency. In contrast, ICTs used for foreground processes help foster communication with and engagement of stakeholders. Together, this makes the use of ICTs a valuable extension to existing evaluator skillsets, especially when the tools are mindfully incorporated to fit a project's contextual complexity. The findings also point to a number of barriers – at both the individual and organizational levels - that inhibit further integration of technology into evaluation practice. A conceptual framework developed as a result of the findings visually depicts this process, and it represents a significant contribution of the thesis. Given the growing proliferation of ICTs in all aspects of life, further insight through systematic inquiry is much needed to keep abreast of these rapidly changing trends. The provision of such has implications not only for evaluation practitioners, client organizations and professional evaluation associations, but for the ongoing development of empirical inquiry in the area.

Keywords: program evaluation, information and communication technologies, ICT, technology, research on evaluation, evaluation use, process use, findings use, evaluation practice.

Dedication

This thesis is dedicated to my husband, Justin A. Meador. Your humour and wisdom inspire me, and your strength is what helped me reach the finish line.

And to my parents, who have crossed the ocean so I could have a better life, thank you. I hope I can make you both proud.

Acknowledgements

First and foremost, I would like to thank my supervisor, Dr. Brad Cousins, for his mentorship, encouragement, and the unwavering support he had always provided. I am honoured to have been his student, and will cherish the learning that I now take away with me.

I am also thankful to my committee members - Dr. Richard Barwell, Dr. Isabelle Bourgeois, Dr. Richard Maclure, Dr. Katherine Moreau, and my external examiner, Dr. Tarek Azzam - for contributing their time and thoughtful critique.

I would like to extend my gratitude to my fellow graduate students at the Centre for Research on Educational and Community Services, and especially to Barbara Szijarto, for her continued guidance and friendship. Lastly, I am grateful to Dr. Peter Milley, Dr. Alejandra Dubois, Dr. Louise Lemyre, Dr. Celine Pinsent, Dr. John Sylvestre, Dr. Ruth Kane, and Dr. Elizabeth Kristjansson for making me part of their research journeys.

Funding for this research was provided by the University of Ottawa, and the Ontario Graduate Scholarship.

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Chapter 1: Introduction

Statement of the Problem

In a world of complex problems, any viable solution can be similarly manifold. Program evaluation seldom takes place in straightforward contexts, as the problems these programs are meant to tackle are, too, often multidimensional and complex. The issues of poverty reduction, health improvement, conflict, and gender violence – these are just a few examples of the kind of problems at hand, constituting a challenge for program developers and evaluators alike. In their paper, Corlazzoli, King Wale, Nowak, Parsons (2014) note that,

> Questions remain about what is the best approach to monitor and evaluate concepts and changes that are inherently abstract, complex, and can often only be witnessed over long periods of time. The [monitoring and evaluation] field is unable to systematically collect information rapidly, process it in real-time, and distribute it to all stakeholders in a consumer-friendly format (Corlazzoli, King Wale, Nowak, & Parsons, 2014, p. 6).

Given that social betterment is the impetus for program evaluation (e.g., Henry, 2003), this obstacle has real world implications. One of the ways in which evaluation has been addressing this gap is by introducing new technologies (Corlazzoli et al., 2014). In spite of this, proliferation of information and communication technologies (ICT), the use of these tools for program evaluation is not widespread. Pockets of such activity undoubtedly exist, such as within the international development sector, yet the topic of ICT in program evaluation has been largely understudied. In a study by Jamieson and Azzam (2012), the authors noted that little is known on what motivates evaluators to adopt or shy away from technology in their practice. Identifying this as a research gap, the authors called for further inquiry on the topic. Similarly lacking are empirical studies on ICTs' connection to evaluation use, a strand of literature focused on improving utilization of evaluation findings by stakeholders. The field has had a long-standing commitment to identifying factors and conditions that influence evaluation use and developing

strategies to enhance it. Obtaining a better understanding of the interconnections between technology and evaluation use is thus central given the field's preoccupation with enhancing the influence and impact of evaluation. The focus of this thesis is to explore these two gaps while adding valuable research contributions to this ongoing conversation.

This introductory chapter commences the thesis by exploring the background of the issues outlined above, provides the guiding research questions, overview of the methodology, and a review of the thesis structure.

Background

'Any sufficiently advanced technology is indistinguishable from magic', wrote Arthur C. Clarke in 1973. More than four decades later, this statement has not lost its relevance. Most of us rely on some form of technology on a daily basis, from the GPS embedded in our cars, to technology measuring heart rate or to determining the nutritional value of our food. Increasingly, citizens are embracing social media networks and outlets as a way to 'stay connected'. For example, as of 2018, Facebook encounters 973,000 logins; 375,000 apps are downloaded; and 187 million emails are sent - all in an average minute (Desjardins, 2018). "More than 85 per cent of the world's population lives in areas covered by 2G mobile networks that allow transfer of data, and 70 per cent of the world's population is covered by 3G or better, allowing access to the World Wide Web from mobile phones other wireless networked devices" (IFAD, 2017, p. 9). If observations are not staggering enough, "in some developing countries, more people have access to a mobile phone than to a bank account, electricity, or even clean water" (Kelly, Friederici, Minges, & Yamamichi, 2012, p. 3). In today's interconnected world, the amount of data we create is also staggering, and is said to double every two years (Marr, 2017).

Technology is, simply put, everywhere - both around us and in the palm of our hand, and this ongoing entanglement is part of the reason why a single, sharp definition of 'technology' is illusive. Even the focus of this research study - information and communication technologies (ICT) boast myriad classifications. This wide range too speaks to the varied application of these technologies across sectors such as education, development, as well as policy and governance (Zuppo, 2012). Despite the variety, a common thread across definitions is that ICTs does not merely refer to devices and infrastructures – it can also denote skills and competencies (Zuppo, 2012), or processes, such as the transfer of information intended to support human communication and interaction (Corlazzoli et al., 2014; Hai-Jew, 2010). In a discussion about ICTs, an overlap exists between the 'physical' tools and less tangible 'processes' of "gathering, creating, and disseminating information" (Corlazzoli et al., 2014, p. 8). On one hand, 'physical' ICT tools may include the following:

- hardware (e.g., computers, laptops, basic phones, smartphones, and tablets),
- apps (e.g., Magpi for SMS data collection, Steller for digital storytelling),

and

- software (e.g., Sensemaker, Qualtrics).

Rafteee and Bachan (2013) observed that ICTs can no longer be limited to "'old' or 'traditional' electronic media, such as radio and television, because digitization provides opportunities for various media to work together" (p. 7). The stark lines that defined technologies may simply no longer be there. This is evident in the way media consumption cuts across new channels, such as the streaming of television or radio content on mobile devices (Raftree & Bachan, 2013). However, as noted earlier, ICT is thus not only

concerned with hardware and software applications but also with ‘processes’ and exchanges of information that these applications facilitate (Corlazzoli et al., 2014; Scharbatke-Church & Patel, 2013; Schware et al., 2002). The ICT umbrella may therefore also include the following developments:

- social media (e.g., Facebook, LinkedIn, Twitter, Snapchat, WhatsApp),
- Web 2.0 (e.g., Wikipedia, YouTube, Kickstarter) and
- geographic information systems (GIS).

We are now amidst the phenomenon of ‘datafication’, a process whereby new technologies and our modes of interaction with them are gradually moving human activity online (Petersson, F. Leeuw, Breul, & H. B. M. Leeuw, 2017a). This activity spurs growth of new communities of interest and global villages that seem less constrained by geographical parameters. From an economic standpoint, ICT is playing a key role. New developments such as big data are said to contribute to the growth of the so-called ‘second economy’, which “refers to the economic activities running on processor, connectors, sensors, and executors” (Jin, Wah, Cheng, & Wang, 2015, p. 60). Together, all of these advancements are incrementally contributing to the emergence of a new era, globally.

Like most domains of professional practice, program evaluation has also been affected by ICTs (e.g., Gay & Bennington, 1999; Jamieson & Azzam, 2012). The field of evaluation focuses on systematically collecting, analyzing, and using information to offer a judgment about the merit of a program (Alkin, 2011). Program improvement is one of the principal goals of program evaluation, however, according to some, its overarching mandate is social betterment (e.g., Henry, 2003). In the early going, despite already being an established domain of practice, a common belief in the field was that evaluation reports do

not suit the needs of stakeholders and often end up on dusty shelves. This belief spurred a deep fascination with, and decades of research on, the concept of 'evaluation use' (Deluca, Poth, & Saerle, 2009; Leeuw, 2009; Preskill & Torres, 2000). While there was some opposition to the notion of making use an evaluator's responsibility (Weiss, 1988a; 1988b; 1998), much of the preoccupation with use centred, and continues to centre, on identifying factors and practices that facilitate use. Early work in this stream of inquiry focused on the use of evaluation findings to support discrete decision making (instrumental use) and to enhance learning about programs and the contexts in which they operate (conceptual use). By the late 1990s, the literature on evaluation use developed further to include the concept of 'process use,' which was quite distinct from use of findings (i.e., formal reports, lists of recommendations). Coined by Patton (1997), the concept of process use encapsulates all of the hands-on learning that stakeholders acquire while working with, or being in close proximity to, evaluation. King and Stevahn (2013) remarked that unlike other forms of evaluation use, process use is much more likely to be influenced by the evaluator, who can "develop and enhance evaluation activities in hopes of facilitating purposeful engagement, and with it, possible process use" (p. 55). This means that many evaluators motivated to enhance use, strive to ensure that stakeholders are involved in "making decisions, taking action, and reflecting while conducting an evaluation study" (p. 14). Through this kind of engagement, evaluators potentially lay the groundwork for higher levels of evaluation use. However, involving stakeholders is not always enough for learning to occur. The users' willingness (DeLuca et al., 2009; Feinstein, 2002; Grasso, 2003; Preskill & Torres, 1999; Preskill, Zuckerman, & Matthews, 2003; Torres et al., 2000) and capacity (Cousins, 2003; King, 2007; Patton, 1997, 2008, 2013) to learn in an evaluation also play a part, as does the

situational context (Cousins, 1996; King, 2007; King & Stevahn, 2013; Preskill & Torres, 1999; Preskill et al., 2003; Shulha & Cousins, 1997; Sridharan & Nakaima, 2011; Taut & Alkin, 2003).

Social interdependence theory tells us that to achieve a goal, individuals must be part of interdependent relationships, and goals must be common in nature (King & Stevahn, 2013). This theory, commonly applied to education, states that interdependence is achieved by constant 'promotive interaction', or in other words, a coordinated effort to build a learning environment (D.W. Johnson, 2003). When applied to program evaluation, social interdependence theory can be a useful tool for explaining the dynamics that may allow process use and use of findings to occur, as it will be discussed below. Since promotive interaction is said to occur as part of a systematic and coordinated effort, this has strong implications for evaluation practice, especially given the growing number of ICTs readily available to evaluators. Love (2004) noted that ICTs emphasize the "union between computers and telecommunications", and can be useful for evaluators by "enhancing the use of familiar methods to achieve better, less expensive evaluations, and by accessing the wellspring of innovation to fashion new tools and create new evaluative processes" (p. 2). ICTs can now be utilized in every stage of the evaluation process, whether by simplifying data collection and analysis with, communication with stakeholders, or by offering multiple channels for data dissemination, for example. Nevertheless, the field has been perceived to lag behind in terms of technology adoption (Azzam & Robinson, 2013; Petersson et al., 2017a). This may be part due to the perception that technology-enabled evaluations lack rigour or reliability, leaving the practice in the 'paper-based' age despite steady and unbridled technological growth (Raftree & Bamberger, 2014).

Evaluation may soon be facing competition from other 'evaluation-like activities' that are engaging with applications of ICT (Petersson et al., 2017a). However, juxtaposed to Arthur C. Clarke's quotation is an assertion by R. Buckminster Fuller, stating that 'humanity is acquiring all the right technology for all the wrong reasons'. In the face of technological acceleration and social media growth, not much empirical research exists on how evaluation practitioners are using ICT. In other words, what is there to gain from ICT use, and likewise, what is lost by not keeping up with the current trends? Similarly unexplored are the implications of ICT for evaluation stakeholders, that is, individuals with a vested interest in the program's development or operations. This group of individuals are the main audience and consumers of evaluation products. In what way, if at all, can ICT then contribute to evaluations being useful, or is this simply the case of a 'solution looking for a problem'? This thesis is an explorative attempt to inquire deeper into this topic, with an eye of benefitting the field both in offering new insights, and in stimulating further research.

Research Questions

My motivation for this thesis derives predominantly from two gaps – limited understanding about evaluators' motivation to adopt technology and limited empirical research on technology and evaluation use – noted above. Approached from a critical realist perspective, and guided by a conceptual framework that builds on theories of process use and social interdependence theory, I aim to address the following research questions:

1. What is the role of ICT in facilitating promotive interaction of program stakeholders undergoing the evaluation process?
2. In what way does the use of ICT influence evaluation process use, and the use of

evaluation findings?

3. Which evaluation contexts / situations may or may not be most appropriate for ICT use in evaluation?

4. How can the role of ICT in program evaluation and its relationship to evaluation use be conceptually understood?

5. In what ways do evaluator and stakeholder perceptions of ICT as a promotive interaction tool converge?

Overview of Methodology

This thesis was a mixed-methods study that employed a sequential explorative design. As I will discuss later, this design was deemed especially suitable for this study given that ICTs in program evaluation have not been amply studied. It consisted of two components: qualitative (Study 1), followed by quantitative (Study 2). Collectively, these studies aimed to answer the research questions by collecting data from two sources. Study 1 intended to conduct qualitative interviews with a sample of evaluation practitioners who actively employ these technologies in order to obtain a more nuanced and in-depth look at some of the ways in which ICTs are influencing practice. Following this initial study, Study 2 surveyed a larger cohort of evaluation practitioners belonging to four evaluation associations and societies[1]. In both Study 1 and 2, the research intended to obtain parallel data from a yoked sample of organizational stakeholders, specifically to address the fifth and final research question. This aspect of the research turned out

[1] Responses were drawn from three major associations: American Evaluation Association (AEA), Canadian Evaluation Society (CES), and European Evaluation Society (EES). The questionnaire was also later disseminated to the mailing list of International Development Evaluation Association (IDEAS), but drew very few responses. Although invitations were also sent to the Australasian Evaluation Society (AES) and African Evaluation Association (AfrEA), these also ultimately drew no responses.

to be particularly challenging. Specifically, despite numerous attempts to recruit stakeholder participants, no responses were yielded, compromising this component of the research.

Structure of the Thesis

This remainder of the thesis is structured into five main chapters. Chapter 2 reviews the existing literature and serves as a basis for formulating the conceptual framework that guided this study. Chapter 3 describes methodological choices and specifications including my epistemological stance and positioning as the researcher conducting the study. Chapters 4 and 5 present the findings from the sequenced studies and summaries that address the research questions. These chapters also discuss the development of a conceptual framework that emerged from both the theoretical underpinnings, and study findings. Lastly, Chapter 6 concludes the thesis with the discussion, comprising of study limitations, and considers implications for future research and evaluation practice.

Chapter 2: Survey of Literature and Conceptual Framework

The thesis draws on three domains of inquiry in order to survey what is known in the area and identify any potential knowledge gaps. In the ensuing sections, the published scholarship that I review helps to define the landscape for the development of the conceptual framework to guide the inquiry. Along the way, I will comment on the availability and the quality of relevant research-based knowledge. I begin with some discussion about the evolution of the field of program evaluation and then, provide a synthesis of the published scholarship on evaluation use, especially the comparatively recent concept of process use. Next, I present a summary of research on ICT specifically as it relates to program evaluation. Finally, I present an overview of literature on social interdependence theory, and its practical application, cooperative learning, which helps to focus the conceptual lens for this study. Through this literature review, I aim to map out the theoretical landscape that underpins the research and identify gaps in our understanding about the relationship between ICT and evaluation practice and use. Ultimately, I integrate these analyses into a conceptual framework to guide the research.

What is the Field of Program Evaluation?

Although it is difficult to situate the exact origin of program evaluation as a distinct field, evaluation scholars generally agree that it emerged in North America in the latter half of the 20th century. Following World War II, the United States federal government, along with private funders, launched a number of programs aimed at various sectors such as health, education, and urban development, to name a few (Rossi, Lipsey, & Freeman, 2004). During this time, as more funds were set aside for development of social programs, an interest in accountability of these

programs had surfaced in parallel. Fairly rigorous social research methods were already developed prior to World War I, and these were later applied for gauging accountability of programs, making program evaluation a routine occurrence by the end of the 1950s (Rossi, Lipsey, & Freeman, 2004). In 1962, federal funding was for the first time allotted to measure effectiveness of a juvenile delinquency program (Weiss, 1987). Scholarship on the topic of evaluation also gradually increased, and despite its interdisciplinary character, a distinct field soon emerged. Program evaluation can be broadly defined as a systematic inquiry to judge the merit and worth of a program or project (Alkin, 2011; Stufflebeam, 2001). What sets the field apart is rather than relying only on intuition or 'working knowledge' to determine merit or worth, as is the case with more informal evaluation that takes place every day, program evaluation aims to collect data to make this judgment (Alkin, 2011). It does so by relying on established "social science methodologies and professional standards" (Newcomer, Hatry, & Wholey, 2010), such as the AEA's Guiding Principles for Evaluators (American Evaluation Association, 2018). Originally implemented in 1995 (see Shadish, Newman, Scheirer, & Wye, 1995), these principles, or similar configurations[2] have now been adapted and are being used by most evaluation associations and societies worldwide. One such example is CES' Competencies for Canadian Evaluation Practice (Canadian Evaluation Society, 2018).

Evaluation differs from social sciences more generally in that it necessarily involves judgment. Evaluation results are typically intended for a specific 'audience' for the purpose of decision making concerning the program or project that was evaluated. This audience most often includes those with a significant stake in the program – funders, program developers, program

[2] Such as the 'Program Evaluation Standards' of the Joint Committee for Standards in Educational Evaluation. These standards were adopted by the Canadian Evaluation Society in 2012. https://evaluationcanada.ca/program-evaluation-standards

managers, front-line staff, and others with important interests - intended beneficiaries, special interest groups, and members of society.

Evaluation can be generally grouped into formative, summative, and developmental categories. The purpose of formative evaluation is to collect input to help improve the way a program is being delivered, whereas summative evaluation is tasked with measuring outcomes and impacts the program might have achieved (Newcomer, Hatry, & Wholey, 2010). In contrast to these two types, developmental evaluation "supports innovation development to guide adaptation to emergent dynamic realities in complex environments" (Patton, 2011, p. 1). This kind of evaluation focuses on ongoing inquiry, rapid feedback to stakeholders, and on testing new approaches to discover novel solutions. Developmental evaluation is a significant departure from formative and summative evaluation in that a program (or intervention) does not yet exist (i.e., it is being developed). In most cases, once developmental evaluation successfully contributes to program development, more traditional formative and summative approaches can then be used.

As noted by Newcomer et al. (2010), beyond these three distinctions, there can be a number of other factors that influence how the evaluation might be structured, such as the timeline of the project; the nature of exchange between the stakeholders and evaluators; the kinds of methods used; and whether or not the evaluation is goal-based or goal-free. Given the field's growth, scholars now recognize that evaluation can take many approaches and serve different purposes. In fact, as of 2001, twenty-two evaluation approaches were already identified (Stufflebeam, 2001), and others have likely emerged since.

A typical program evaluation proceeds in the following way (e.g., Alkin, 2011): (1) evaluation planning activities, such as identifying stakeholders; gaining an understanding of the

evaluation context and the program; developing evaluation questions and instruments; finalizing the evaluation plan; (2) data collection; (3) data analysis; and (4) reporting on the evaluation results. These activities occur in tandem with other activities meant to build positive relationships with stakeholders, and potentially disseminate findings to other audiences.

Communication with stakeholders. Besides being a systematic exercise, evaluation is first and foremost about working with stakeholders – such as funders, staff, or intended beneficiaries – that hold a stake in the program. Although these groups may have different goals for the evaluation, understanding their concerns and "planning appropriate means for interacting with at least the major stakeholders" is important (Rossi, Lipsey, & Freeman, 2004, p. 49). Clarity of communication, timely responses, and openness to multiple points of view are essential evaluator skills that have been noted in literature time and again. Paying attention to stakeholders and maintaining good communication are also some of professional standards that program evaluators should strive to uphold, as indicated by the Joint Committee on Standards for Educational Evaluation (Yarbrough, Shulha, Hopson, & Caruthers, 2011), and Competencies for Canadian Evaluation Practice (Canadian Evaluation Society, 2018). Moreover, in recent decades, research on collaborative approaches to evaluation - such as participatory evaluation (Cousins & Chouinard, 2012; Cousins & Earl, 1992; Cousins & Whitmore, 1998), utilization-focused (Patton, 1997; Patton, 2012), and empowerment evaluation (Fetterman, 1994; Fetterman, Rodriguez-Campos, & Zukoski, 2018) - suggests that stakeholder involvement improves usability of findings and promotes ownership. These collaborative approaches focus on "the meaningful involvement of stakeholders in all aspects of an evaluation, including question formulation, design, data collection, analysis, interpretation, recommendations, and reporting"

(Adams, Nnawulezi, & Vandenberg, 2015, p. 244). In a practical participatory evaluation (P-PE), the evaluator works closely with primary users, that is, those that have a vital interest in the program, to build evaluation capacity by providing technical evaluation training which allows the stakeholders to "learn on the job" (Cousins & Earl, 1992, p. 400). Responsibility over the success of the project is thus shared, with the evaluator taking leadership of technical tasks and stakeholders helping to identify evaluation questions, setting the scope of the project, and participating in data interpretation activities (Cousins & Whitmore, 1998). Transformative participatory evaluation (T-PE) aims to empower participants by allowing stakeholders to maintain control over the production of knowledge, thus transforming "power relations and to promote social action and change" (Cousins & Whitmore, 1998, p. 9). While there are similarities between the two approaches, their primary functions differ: P-PE is concerned with problem solving, whereas T-PE aims for community empowerment (Cousins & Whitmore, 1998). In contrast, the utilization-focused evaluation aims to achieve "specific, intended uses" by working closely with the primary users of the evaluation (Patton, 2008, p. 37). Lastly, empowerment evaluation is a collaborative evaluation approach that prioritizes group processes, and aims "to help communities monitor and evaluate their own performance" (Fetterman, 2015, 577). This can be done through a variety of tools, including a three-step process that centres on establishing a shared vision; identifying baselines and prioritizing activities; and implementing specific evaluation strategies that can help contribute to the achievement of the shared vision (Fetterman, 2015). In conclusion, meaningful communication with stakeholders is embedded across all of these collaborative approaches to evaluation, and is seen as an important element of a successful evaluation process.

Evaluation Planning. Evaluations are seldom conducted without first tending to the initial planning stages. Depending on the evaluation approach, this stage can be very comprehensive. To summarize the main steps, evaluators can begin by identifying stakeholders and intended beneficiaries to work with. Ideally, evaluators then work with these stakeholders to determine the scope of the program or project, as well as formulate evaluation questions (Cousins & Whitmore, 1998). In essence, the planning stage helps to build an understanding of how the evaluation should unfold, and aims to identify potential issues before they arise. It aims at understanding what entity is to be evaluated, and the role of the players involved.

Much of the work at this stage also deals with concepts, for example, deconstructing how the stakeholders understand the program entity; or by identifying factors that will indicate success. This stage also focuses on building consensus not only about concepts, but also strategies and proposed approaches (Newcomer et al., 2010). In that sense, evaluation planning is perceived to be the most difficult stage of the entire project (e.g., Bar & Mentch, 2017; Trochim, 1989a).

Data Collection and Analysis. Guided by the evaluation questions, evaluators are expected to collect the relevant data for answering those questions (Alkin, 2013). This may entail reviewing existing documents or devising instruments for collection of new data. Recently, the notion of using mixed methods has gained widespread acceptance and support in the evaluation community, entailing that, as opposed to a one-size-fits-all design, multiple methods may be required to answer different evaluation questions or even one question (Alkin, 2011; Greene & Caracelli, 1997). This usually means using a combination of quantitative and qualitative methods, such as juxtaposing and/or integrating ‘objective’ data of surveys with more ‘subjective’ findings from interviews.

Reporting. Evaluation reporting is an expected part of communicating with stakeholders. It also entails a two-way communication process whereby the evaluator brings attention to observable issues, and stakeholders have an opportunity to provide input or correct the program strategy based on these findings (Alkin, 2011). Although in the past reporting typically consisted of a written report, more and more options are being explored as viable alternatives, such as digital storytelling, multimedia, infographics, and so on (Alkin, 2011). Evaluators now recognize that stakeholders may be more susceptible to different kinds of learning, therefore diversifying evaluation products is becoming commonplace in evaluation practice. Reporting varies greatly, and depends on the information needs of the stakeholders involved.

It warrants to be said that stakeholder needs and contextual differences play an important role in deciding which evaluation approach is appropriate. For example, beyond its initial preoccupation with accountability and judgments about merit and worth, program evaluation can also serve an important function in learning and capacity building of evaluation stakeholders and their organizations (Cousins, Goh, & Elliott, 2004). In some cases, program evaluation can be used to develop a program by relying on collected data to make incremental changes, while in others, it can incite change within the higher echelons of the organization, and beyond (Cousins & Bourgeois, 2014; Labin, Duffy, Meyers, Wandersman, Lesesne, 2012; Nielsen, Lemire, & Skov, 2011; Patton, 1994; Patton, 2012). The evaluator's role has also expanded, allowing for both an 'objective observer' on one end of the spectrum, and an 'embedded facilitator' on the other (Barry et al., 2018).

Program evaluation "has yet to develop a singular, overarching, unifying theory" (King & Alkin, 2019, p. 435). The field's short but rich history contributed to a wealth of options with respect to tools at evaluators' disposal. However, the central theme of this development has been

the concept of evaluation use, which I will discuss next.

How Do We Understand Evaluation Use?

One overarching theme in the evaluation literature is evaluators' insatiable quest for strategies to effect higher levels of evaluation use. Most evaluators and evaluation scholars would agree that regardless of approach, the results (and importantly, process), of the evaluation exercise should be somehow useful to those with a stake in the program. The issue of evaluation use has been one of the most dominant themes in evaluation literature, and remains the focus for considerable empirical research. Among the earliest articles on evaluation utilization was a seminal article published by Weiss in 1967 (Weiss, 1998), where it was pointed out that the findings derived from evaluations of federal programs in the United States were not being used. Since this foundational article, the evaluation field spent several decades discussing and studying the concept of use, and attempting to understand how best to achieve it. While some authors (Henry & Mark, 2003; Kirkhart, 2000; Mark & Henry, 2004) have chosen to expand the scope of interest and use the term 'influence', this concept has been noted to be outside of evaluator's control since it is often unintended and invariably indirect (Alkin & Taut, 2002). I therefore consciously omitted this strand of literature.

What is Evaluation Use?

Although it characterizes an outcome most evaluators actively pursue, the concept itself has been approached as a roadmap with many potential routes. In fact, despite decades of rigorous research, no single definition of evaluation use exists. Broadly speaking, evaluation use can mean any "concern that affects the evaluation findings or the experience of the

evaluation process" (Patton, 2012, p. 4). To encapsulate the broad character of use, Alkin and King (2017) consolidated the recent research by expressing it in a form of an adapted Guttman-mapping sentence, seen in Figure 1 below.

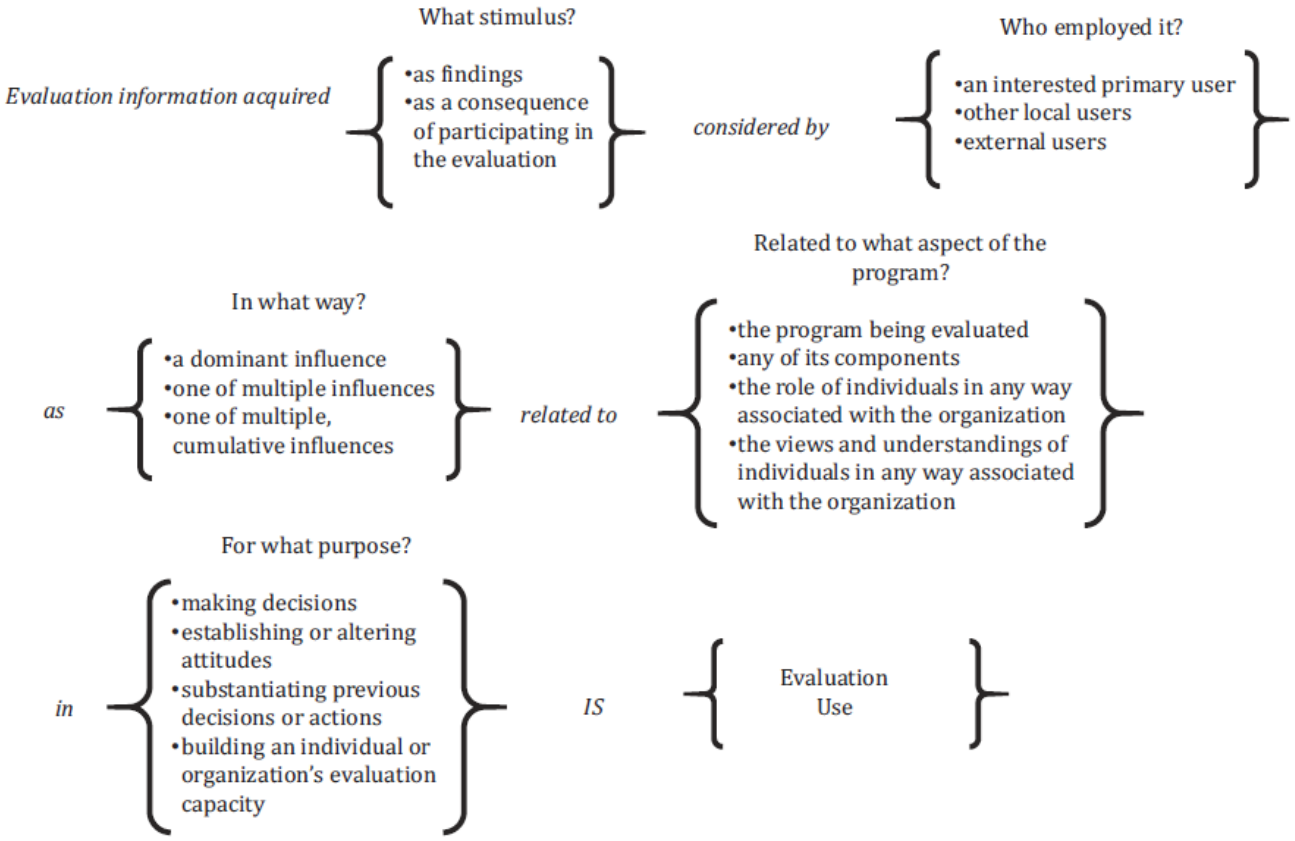

Figure 1: Alkin and King's (2017) diagram of evaluation use expressed as a Guttman-mapping sentence

This figure highlights that evaluation use is a sum of multiple factors. The nearly infinite combination of needs, actors and contexts suggests that use is not likely to occur in the same way twice, thus obscuring the possibility for a clear definition. Recently, King and Alkin (2019) also described that theory of use typically employs a 'pattern', whereby

> use results when certain types of users (i.e., those committed to use) interact with certain types of evaluators (i.e., those committed to fostering use) to do evaluation activities in a certain way

> (e.g., using appropriate and credible methods) in certain contexts (i.e., environments where potential users can take action based on the evaluation process/results) (p. 432).

The authors noted that thinking about evaluation use theory in this manner allows space for context-specificity (King & Alkin, 2019).

Understanding which factors contribute to evaluation use has too inspired extensive research. For example, a number of authors noted the importance of relevance of findings; credibility of the evaluator; users' involvement; good communication; and the users' perception of evaluation; among many other factors (e.g., Cousins & Leithwood, 1986; Shulha & Cousins, 1997). Conversely, factors that detract from evaluation use have also been noted. For example, by analyzing evaluations for twenty-three programs within the Canadian federal government context, Bourgeois and Whynot (2018) identified the following barriers to evaluation use:

> "the time required to conduct evaluation and disseminate findings, the evaluation "jargon" used in the reports, the type of reporting used, staff turnover during evaluation projects, issues related to performance measurement data, the generally positive tone of the findings, perceived bias in terms of evaluation participants, risk aversion due to the *Access to Information Policy*, and evaluation staff being pulled into other initiatives and activities during a project" (p. 340).

Taut and Alkin (2003) also categorized factors affecting use into three categories – human (user and evaluator), evaluation, and contextual:

- "The human (or personal) factor describes evaluator and user characteristics—for example, previous experiences with evaluation, user knowledge about evaluation, and perceptions about the credibility of the evaluator.
- The evaluation factor, concerns the way the evaluation itself is conducted. This includes procedural issues such as ethical conduct, but also the appropriate choice of an evaluation design, data collection methods, and the overall quality of outcome information provided by the evaluation.
- The context factor refers to how contextual variables, including the broad political and organizational background as well as specific program features and administrative structures influence the barriers an evaluation has to face" (p. 215).

Ongoing research suggests that the evaluator's role is clearly a multifaceted one, and that similarly, evaluation use required effort to achieve (Shulha & Cousins, 1997). By focusing

on evaluation use, evaluators became naturally expected to facilitate the evaluation process and consider stakeholder needs, and how these might influence use down the road (Patton, 1994; Patton, 2012; Preskill & Torres, 1999). As noted earlier, one evaluation approach almost wholly focused on evaluation use is utilization-focused evaluation (UFE) (Patton, 1997; 2008). UFE is a principles-based evaluation approach (Patton, 2011), in that it ascends above evaluation 'paradigm wars' (Leeuw, 2009), and does not advocate for any model or method. Rather, it stresses the importance of engagement and situational responsiveness to help the primary intended users arrive at their own version of these concepts (Patton, 2011).

As noted above, while no agreed upon operational definition exists, 'use' is generally said to be instrumental, symbolic, conceptual, or process-oriented in nature (e.g. Shulha & Cousins, 1997). The first three categories constitute what is referred in the literature as 'findings use' (Patton, 2007). Instrumental use refers to some form of action or program improvements that occurred due to the evaluation taking place (Harnar & Preskill, 2007; Mark & Henry, 2003; Neuman, Shahor, Shina, Sarid, & Saar, 2013; Rossi, Freeman & Lipsey, 1999). Use can also "refer to waving the flag of evaluation to claim a rational basis for action (or inaction), or to justify pre-existing positions (i.e., symbolic use)" (Mark & Henry, 2003, p. 294). Symbolic use assumes that while an evaluation was commissioned, there is no real intent to use its findings (Patton, 2008). In such cases, evaluation findings can help confirm ongoing "anecdotal impressions on the program", even when decisions concerning the program have already been made (Bourgeois & Whynot, 2018, p. 336). Both instrumental and symbolic use "map directly onto the accountability function of evaluation" (Cousins, Hay, & Chouinard, 2015, p. 95). In this sense, these types of use are more closely related to 'box-checking' whereby the

government or funding agency is predominantly interested in finding evidence of funds well spent. However, although accountability has been at the core of the evaluation profession since its inception, it is its learning function that has been found to be especially important for evaluation use. Conceptual use signifies changes in the way stakeholders think about their program or its mandate (Harnar & Preskill, 2007; Mark & Henry, 2003; Rossi et al., 1999), and aims to increase understanding of what is being evaluated (Neuman et al., 2013). This kind of use is more closely connected to the learning function of evaluation (Cousins, Hay, & Chouinard, 2015), even if no concrete action takes place (Alkin, 2011). While conceptualizing findings use has been worthwhile, Shulha and Cousins (1997) noted that process use is of special interest to the program evaluation field. This is because process use has the potential to encapsulate the three other forms of use discussed above (Alkin & Taut, 2002), and even to enhance findings use (Patton, 2008).

Process use can be defined simply as the any form of learning that is obtained while stakeholders either participate in evaluation-related activities or are of close proximity to them. Some would argue that process use is derived from the assumption that evaluation stakeholders obtain the most use out of evaluations from which they can learn. The type of learning that is at play here is differentiated from "learning substantive knowledge about something" (p. 153), such as program functioning or the context within which it resides. Instead, participants are assumed to learn how to think 'evaluatively' and critically - in essence, they are learning 'how to learn' (Patton, 2008, p. 153). Buckley, Archibald, Hargraves, & Trochim (2015) provided a more nuanced description of evaluative thinking, defining it as "critical thinking applied in the context of evaluation, motivated by an attitude of inquisitiveness and a belief in the value of evidence, that involves identifying assumptions, posing thoughtful questions, pursuing deeper

understanding through reflection and perspective taking, and informing decisions in preparation for action" (p. 4). The skills acquired through process use are in turn meant to influence stakeholders to make changes within their own organizations (Patton, 2008). This means that through learning and by being active participants in the process, users may be more receptive to using evaluation findings, which document this very process (Alkin & Taut, 2002; Patton, 2008). In a world where evaluation findings can have a short window of relevance, process use is believed to have a more lasting impact (Patton, 2008).

When first introduced, the concept of process use also offered a refreshing delineation from traditional utilization literature, which Leviton (2003) argued was so often characterized in linear terms and with the assumption that evaluators know how their evaluations should be used. While a number of evaluation scholars and practitioners (e.g., Cousins & Leithwood, 1993; Forss, Cracknell, & Samset, 1994; Patton, 1994) made note of this dynamic, it was Patton who coined the term in 1997. Process use, as he defined it, "is indicated by individual changes in thinking and behaviour, and program or organizational changes in procedures and culture that occur among those involved in evaluation as a result of the learning that occurs during the evaluation process" (Patton, 2008, p. 155). Patton (2008) theorized that process use can take shape of different kinds of learning, including learning that is: "(1) infusing evaluative thinking into an organization's culture, that is, building the organization's capacity to independently conduct future evaluations; (2) enhancing shared understandings, such as getting at what goals the program is meant to accomplish; (3) supporting and reinforcing the program through intervention-oriented evaluation, by making data collection an integral part of program delivery; (4) instrumentation effects, such as ensuring that the organization is taking note of, and measuring indicators of success; (5) increasing participants' engagement, sense of

ownership, and self-determination, and lastly, (6) program or organizational development" (p. 157). In addition, Forss, Rebien, and Carlsson (2002) identified expansion of professional networks, and boosted morale of stakeholders as other examples of process use.

Process use can be planned, such as that which occurs during training sessions or workshops (Preskill et al., 2003); or emergent, such as the learning that takes place during peer-to-peer interaction or as a result of unplanned developments that occur during the evaluation process (DeLuca et al., 2009; Donnelly & Searle, 2017; Podems, 2007). Lastly, process use may occur at multiple levels: individual, group, and at the level of the organization (Amo & Cousins, 2007; DeLuca et al., 2009; Donnelly & Searle, 2017; Forss, Cracknell, & Samset, 1994; Harnar & Preskill, 2007; Patton, 2007; Preskill & Caracelli, 1997; Preskill & Torres, 2000). By working with an evaluator, "rapid development of knowledge structures at the level of individuals and sections of the organization" may occur (Forss, Cracknell, & Samset, 1994, p. 585), signifying that process use, or what these authors called 'learning by involvement' is also an important element of evaluation capacity building (ECB). More recently, ECB has emerged as a distinct branch of evaluation use research (see Bourgeois & Cousins, 2013; Cousins & Bourgeois, 2014; Preskill & Boyle, 2008). Labin et al. (2012) define ECB as "an intentional process to increase individual motivation, knowledge, and skills, and to enhance a group or organization's ability to conduct or use evaluation" (p. 308). In this regard, ECB is the vehicle by which evaluation use or the conditions that support use can be intentionally created.

Despite numerous theoretical discourses about the concept and frequent self-reported accounts of how it can occur in practice, process use is a concept that still requires construct validation (Harnar & Preskill, 2007), and more empirically-derived research (Amo & Cousins, 2007; Donnelly & Searle, 2017; Shaw & Campbell, 2014). Amo and Cousins' (2007) review

of studies published between 1984 and 2005 noted that process use was not studied in a deliberate manner until after Patton's coining of the concept, and even then, the studies were often based on self-report narratives and less on empirical research. This finding was echoed by K. Johnson et al. (2009), whose review of the various forms of use (including, instrumental, conceptual, symbolic, and process) identified fewer than five studies that focused on process use in a systematic manner. Despite these shortcomings, Amo and Cousins (2007) synthesized the research to date by stating that evaluation practitioners were most able to observe process use in the form of increased learning, changes in attitude, and changes in actions and behaviours. In practice, this means acquiring skills in evaluation activities such as data analysis, by reducing anxiety associated with participating in an evaluation, and by changing of internal processes, such as improving record keeping (Shaw & Campbell, 2014).

More recently, Shaw and Campbell (2014) noted that while most systematic studies of process use utilized cross-sectional designs, using longitudinal designs may be a more promising approach given that process use is concerned with learning and development of evaluative thinking, and thus may not be immediately apparent. Using longitudinal design in a multi-site, participatory evaluation project, their research demonstrated that assessing the presence of process use can not only have an effect on the findings generated, but also suggests that process use may need time to 'mature' and emerge (Shaw & Campbell, 2014). This finding suggests that without sufficient time to reflect on the learning, there may be a natural delay between an individual's learning and their decision to act on this newly acquired knowledge (Carden & Earl, 2007; DeLuca et al., 2009; Shaw & Campbell, 2014).

At the present time, considerable gaps in the empirical research on process use remain. For instance, we do not know how often it occurs (Forss, Rebien, & Carlsson, 2002),

and if learning is sustainable over time (Shaw & Campbell, 2014), or what fundamental factors influence process use. In other words, while we know that 'learning-by-involvement' has a role to play in evaluation utilization, it is less clear what roadmap we should follow to get there, or if one even exists. Drawing on their experiences, scholars and practitioners have pointed out some common process use-oriented contexts and principles that may influence use. For example, the evaluation stakeholder/user is naturally required to:

- demonstrate 'buy-in' or demand for evaluation (Bryson & Patton, 2010; DeLuca et al., 2009; Feinstein, 2002; Grasso, 2003; Preskill & Torres, 1999; Preskill et al., 2003; Torres et al., 2000);
- have evaluation capacity, or be ready to actively engage in evaluation activities (Cousins, 2003; King, 2007; Patton, 1997, 2008, 2013); and

have organizational learning capacity - such as leadership values, culture of inquiry, systems and structures that enable users to engage in evaluation, and communication channels for disseminating evaluation information (Preskill & Boyle, 2008). Without these elements, the kind of learning assumed to take place during evaluation processes may not occur. On the other hand, evaluators are also urged to:

- be flexible (Grasso, 2003; Patton, 1998);
- be aware of the organizational context (King, 2007; Preskill & Torres, 1999; Preskill et al., 2003; Shulha & Cousins, 1997; Sridharan & Nakaima, 2011);
- share decision-making with stakeholders (Briedenhann & Butts, 2005; King & Stevahn, 2013; Preskill & Caracelli, 1997); and
- work with stakeholders to build structures that stimulate evaluative learning (Buckley et al., 2015; Levin-Rozalis & Rosenstein, 2005; King, 2007; Patton,

1997, 2008; Roseland, Lawrenz, & Thao, 2015).

Proactively fostering an environment supportive of learning has been considered to be important (DeLuca et al., 2009; Levin-Rozalis & Rosenstein, 2005; Morabito, 2002; Preskill et al., 2003). Roseland et al. (2015) also noted that evaluators aiming for use should "explicitly plan for growth in knowledge, understandings, skills and beliefs from the beginning" (p. 81). For example, routine involvement of users in evaluation is seen as an important part of enabling evaluation capacity (Bourgeois & Cousins, 2013; Buckley et al., 2015; Labin et al, 2012), and acquiring new forms of thinking (Roseland et al., 2015). Collaborating with users is seen to also foster trust (DeLuca et al., 2009; Taut & Alkin 2003; Taut, 2008), and deeper understanding among clients (Contandriopoulos & Brousselle, 2012; Harnar & Preskill, 2007; Morabito, 2002; Neuman et al., 2013; Patton, 1998, 2008; Preskill et al., 2003; Roseland et al., 2015). To conclude, since the evaluator function now falls between being an objective observer and a facilitator, the notion of navigating contexts and deliberately prioritizing stakeholder involvement appear to be widely accepted aspects of evaluation work.

Thanks to decades of research, the knowledge base on evaluation use is well developed. Although a single definition is not likely to emerge within the near future, contributions of this research have been able to lay an impressive foundation for thinking about evaluation use from both theory and practice perspectives. It should also be mentioned that the kind of evaluation use is often contingent on the function of evaluation (Cousins, Hay, & Chouinard, 2015). In contexts where accountability is favoured, findings use may be more likely, whereas in contexts that prioritize learning, conceptual use and process use may be more commonplace. Both are examples of evaluation use, however the

chief difference is that process use is typically skill-based and focuses on teaching stakeholders (directly or indirectly) how to develop the ability to perform their own evaluation or to otherwise think like evaluators; whereas findings use focuses on learning through the production of results, such as evaluation reports and summaries. These forms of use are not mutually exclusive, and can occur in tandem (Alkin & Taut, 2002; Patton, 2008), although empirical evidence supporting this assertion is limited.

It should be noted that in early 2000s, when research on evaluation use already amounted to decades, insight into how stakeholder and evaluator perceptions converged was limited (Cousins, 2001), and this appears to be largely unchanged today. For example, Brandon & Fukunaga (2014) noted that what we know about stakeholder involvement is derived from "reflective narratives and essay-like articles" (p. 28) written from evaluators' points of view. Stakeholder voices continue to remain largely absent from empirical research on use, such as research on what works when and for whom. This limitation suggests that what we know about use remains an incomplete depiction of reality.

Implications of ICT for Program Evaluation

Research at a glance.

As I discussed earlier, ICTs have revolutionized how people and organizations work, live, and communicate. These changes appear to be ongoing, as every year, ICT becomes more and more pervasive in our lives and our workplaces. These developments are likely to have profound implications for the field of program evaluation, both in terms of facilitating process use and instrumental and conceptual use of findings, as I will discuss below.

Broadly speaking, research on ICT in evaluation can be typically conceptualized into

two categories. The first concerns evaluations of online environments, such as distance learning; or of interventions using ICT, such as e-health programs. The second category relates to the use of ICT within program evaluation practice, and explores various tools that can be used by evaluators to plan and conduct evaluations. This thesis focuses on exploring the second category of research.

Compared to other topics within the field, research on ICT use in evaluation is somewhat underdeveloped. Some authors publishing in this area concur with this observation (e.g., Azzam & Robinson, 2013; Jamieson & Azzam, 2012; Materia et al., 2016; Raftree & Bamberger, 2014). Given its interdisciplinary character, knowledge of new tools is likely to eventually permeate evaluation from overarching disciplines, such as social science[3]. However, one mindset is that further inquiry is necessary in order to identify how ICT can influence the development of new methods (Azzam & Harman, 2016; Love, 2004). In the following section, I will review the literature sample characteristics, discuss major themes dominating the discourse, as well as provide brief summaries of some ICTs and ICT-enabled processes frequently discussed in the context of evaluation activities.

Sample characteristics.

The studies included in this review are derived from academia, specifically, from major

[3] Oxford University Press released a Handbook of Emergent Technologies for Social Research in 2011. This volume focuses on a number of ICT tools that, to my knowledge, remain underexplored in program evaluation, such as tools for assessing social feelings (see Visser & Mulder, 2011), or digital storytelling (see Gubrium & Nat Turner, 2011).

peer-reviewed evaluation publications[4], and some grey literature. Of the studies found, only those with direct relevance to the research topic were included in this review. Their relevance was determined by examining the degree to which ICT was discussed. In other words, studies where authors made only a superficial mention of technology were omitted. Of particular interest were studies and reports that explicitly emphasized ICT use in evaluation, whether by providing conceptual insight or by detailing in-depth discussions about practical applications.

The grey literature I was able to locate was practitioner-oriented, with many of the reports published and disseminated by international bodies such as the United Nations and the World Bank. The majority of these reports were structured as repositories of descriptions of ICT tools available for use in monitoring and evaluation (M&E), and offered hands-on guidance for practitioners as well as frontline staff.

The bulk of the academic research in this review is of conceptual nature, with authors often engaging in discussions about ICT tools and their potential value for the field. In some cases, authors provided narratives about actual applications of ICTs, although these at times lacked the detail and rigour essential for empirical case studies. Only a small number of the studies in this sample – those that pertain to online crowdsourcing - would constitute empirical research on evaluation. Brief summaries of these studies are presented in Table 1 below.

[4] The publications consulted include Canadian Journal of Program Evaluation; American Journal of Evaluation; New Directions for Evaluation; Evaluation and Program Planning; Evaluation Journal of Australasia; The Evaluation Exchange; Practical Assessment, Research and Evaluation; Journal of MultiDisciplinary Evaluation; Evaluation Review: A Journal of Applied Social Research; Evaluation: International Journal of Theory, Research, and Practice. The search terms included 'information and communication technologies', 'ICT', 'technology', 'online', 'digital', etc. The decision to focus the search on major evaluation publications helped to further bound the scope of the study.

Table 1

Review of documents pertaining to ICT use in program evaluation

Citation	Document type	Research type[5]	Type of ICT discussed	Summary
Azzam (2013)	Journal article (New Directions for Evaluation)	Conceptual	GIS	This article introduces evaluation practitioners to the use of GIS, detailing the steps that this process might entail. The article also discusses several limitations of this technology. This includes the level of training required to use the tool. The author also cautions against drawing conclusions without first carefully examining all data.
Azzam & Harman (2016)	Journal article (Evaluation and Program Planning)	Empirical	Crowdsourcing	The article details findings from a research on evaluation study conducted to assess the viability of crowdsourcing (through MTurk) in quantifying qualitative data, such as applying a Likert scale to text segments and to highlight relevant quotes. The findings reveal that Mturkers were able to produce a stable rating and highlighted text segments that were relevant, signifying that this approach may have merit for other evaluation studies.
Azzam & Jacobson (2015)	Journal article (New Directions for Evaluation)	Conceptual	Crowdsourcing	The article discusses the future of research on evaluation, and lists multiple ways that it can be fostered within the evaluation community. The authors point out that crowdsourcing may enrich research on evaluation by helping to identify best practices, such as how evaluative information should be communicated to the public. It can also pilot and test new evaluative methodologies before these are used with stakeholders.

[5] Studies that included detailed methodologies were classified as 'Empirical' studies, whereas those that did not or included only brief case narratives were classified as 'Conceptual' studies.

Citation	Document type	Research type[5]	Type of ICT discussed	Summary
Azzam & Jacobson (2013)	Journal article (American Journal of Evaluation)	Empirical	Crowdsourcing	The authors present findings of a research study they conducted to assess whether MTurk-created matched-comparison group and randomly assigned control group produced similar findings. Their findings suggest that the findings were indeed similar, signaling that the MTurk platform can help evaluators connect with an accessible and inexpensive workforce. A number of limitation still exist, such as participants not meeting the sample criteria, or being only able to provide feedback on generic subjects such as project-specific information.
Azzam & Robinson (2013)	Journal article (American Journal of Evaluation)	Conceptual	GIS	This article discusses how GIS may be utilized in evaluation practice. As defined by the authors, this process integrates geographic and other kinds of data to generate visual maps and identify any underlying patterns. In evaluation, GIS may be used to see how the program is affecting its surrounding area, and whether it is having its intended effect. The article showcases a fictional scenario of how GIS may be used in practice.
Baig, Shaw-Ridley, & Munoz (2016)	Journal article (Evaluation and Program Planning)	Empirical	GIS	The authors conducted geo-spatial analysis of survey data to gauge the degree to which the health needs of a population living along the US/Mexico border were being met by existing services. The article illustrates how application of GIS tools can be helpful in visualizing data, and in steering discussion about program delivery options.
Bamberger, Raftree, & Olazabal (2016)	Journal article (Evaluation)	Conceptual	Various (mobile devices, social media, GPS)	The evolution of ICT, especially in development evaluation, has been tackling some of the ongoing challenges in evaluation, such as high costs. The tools have also permitted vulnerable groups, previously exclude from the process, to partake in evaluation. The authors argue that this evolution has nevertheless introduced new issues of its own, such as those concerning accessibility of data, and privacy and safety of individuals.

Citation	Document type	Research type[5]	Type of ICT discussed	Summary
Batsche & Reader (2012)	Journal article (Evaluation and Program Planning)	Conceptual	GIS	The article focuses on showcasing a GIS prototype used for evaluating suitability of housing units for youth transitioning from foster care to self-sufficiency. The authors suggest the GIS is a tool that can help evaluators and program staff answer specific questions with respect to program delivery, as long as geographical data for the region in question is available. However, the authors note that this tool is best used in a cross-disciplinary team setting where the possibility of misuse can be mitigated.
Belden et al. (2013)	Report (The World Bank)	Grey literature	Various (mobile devices, applications, GIS, etc.)	There has been a growth in the use of ICTs in M&E processes of agriculture and forest sectors. Challenges to implementation still remain, such as keeping up with technology that is constantly evolving. The authors stress that ICT systems must be carefully deliberated, and their 'fit' for the purpose must be gauged prior to implementation. 'Project needs' and 'people needs' must be compatible. ICT use is still encouraged for M&E, as learnings can help inform future implementation. The report includes a review of five case studies of development projects that used various ICTs.
Bennington (1999)	Journal article (New Directions for Evaluation)	Conceptual	Digital multimedia	The author highlights the importance of being cognizant and making visible the implications of technologies used for evaluation purposes. Arguing that technology tools are not 'neutral', the author notes that evaluators have the professional responsibility to be aware of ethical consequences that technology can bring about. Given that certain tools have the power to reveal dimensions not otherwise seen, technology non-use becomes equally important and carries its own ethical considerations.
Bennington, Gay, & Jones (1999)	Journal article (New Directions for Evaluation)	Conceptual	Digital multimedia	The authors suggest that digital audio and video can contribute to mixed-method evaluation by providing alternate lines of evidence. Two examples of how the authors used multimedia were provided. The use of video was found to be especially useful for justifying qualitative observations. This method was also found to be laborious and raised issues of privacy. The authors suggest that using multimedia in evaluation requires a new kind of skill – a multimedia literacy.
Colville (2013)	Discussion paper (UNDP)	Grey literature	Various (mobile devices, data visualization, crowdsourcing, etc.)	This report consists of a review of available ICT tools for monitoring and evaluation, including mobile technologies and crowdsourcing. Each tool is discussed with its advantages and disadvantages in mind, and the author provides brief examples of how each particular tool was employed in practice.

Citation	Document type	Research type[5]	Type of ICT discussed	Summary
Corlazzoli et al. (2014)	Report (UK Department for International Development)	Grey literature	Various (mobile devices, social media, big data, online surveys, data visualization, etc.)	This report discusses potential uses of ICT in M&E, with a special focus on peacebuilding programmes. The report includes illustrations of various ICT types, discusses advantages and disadvantages of each, and provides examples of specific tools. The author asserts that ICTs have enriched M&E in a number of ways, such as by enabling rapid transmission of data, providing opportunities for more nuanced indicator tracking, cost-saving, and by providing richer evaluation experiences for participants (through collaboration opportunities and by using data visualization to simplify and disseminate findings).
Dawes & Pardo (2006)	Conference proceedings paper	Empirical	Information management systems	The case study described in the paper details the development of an information management system meant to be used for self-assessment by numerous programs dealing with homelessness in New York City, USA. The project included input from and collaboration among both program staff and technology experts. The building of the prototype resulted in positive feedback from stakeholder groups with respect to having access to useful data. The authors stress that success was dependent on communication and trust building among the team; as well as time investment on behalf of the stakeholders.
Dette, Steets, & Sagmeister (2016)	Report (Secure Access in Volatile Environments - SAVE)	Grey literature	Various (mobile devices, remote tensing, GPS, radio, social media)	With a focus on conflict zones, the report recounts a number of ICTs available in M&E. Included in the discussion are guidelines for implementation, an estimation of costs, and a review of costs and benefits associated with each tool. The report includes case studies of successful implementation.
Food and Agriculture Organization of the United Nations (2012)	Bulletin (FAO)	Grey literature	Various (mobile devices, online surveys, information management systems)	This short bulletin summarizes findings from e-forum discussions hosted by the World Bank. It details a short list of lessons learned submitted by practitioners working in the field of M&E. Among these is the need to be selective with technology and choose the tools that are most compatible (based on cost, ease of connectivity, sustainability) with the project. Paying attention to context was also highlighted as an important lesson, as in certain situations ICTs can be detrimental to the evaluation.
Finucane, Martinez, & Cody (2018)	Journal article (American Journal of Evaluation)	Empirical	Big data	The authors discuss how Bayesian statistical computing can help evaluators make better inferences about program effectiveness, and in particular, what works for whom, and do so in a more cost-effective manner than standard RCTs. The authors present a simulated case to illustrate their points.

Citation	Document type	Research type[5]	Type of ICT discussed	Summary
Galloway (2011)	Journal article (New Directions for Evaluation)	Conceptual	Virtual focus groups	The author states that online focus groups can be a useful way to capture data from stakeholders who are geographically dispersed, or as a way to diversify participants. This method can save costs and time, but can be challenging in situations where sensitive topics are being discussed.
Gay & Bennington (1999)	Journal article (New Directions for Evaluation)	Conceptual	Various (digital multimedia, online surveys, information management systems, etc.)	The authors argue that ICT can be valuable addition to evaluation practice, if employed correctly. For example, collaborative tools can aid communication among the team, especially if the team is geographically dispersed. Digital multimedia can also enhance validity claims" (p. 12), when treated with sufficient scrutiny. The chief argument of the article is that the use of ICT tools in evaluation must always be subject to critical reflection, as the tools themselves may have certain rhetorical underpinnings.
Harman & Azzam (2018)	Journal article (Evaluation and Program Planning)	Empirical	Crowdsourcing	This article discusses findings of a research study that was conducted to weigh on the usefulness of crowdsourcing as a method to code qualitative data, and as a tool for theory-driven evaluation. The study yielded mixed results, and the authors stress that further inquiry is necessary. Nevertheless, the findings suggest that crowdsourcing can be useful in providing alternate points of view, and do so quickly and relatively inexpensively.
Hilton & Azzam (2019)	Journal article (American Journal of Evaluation)	Empirical	Crowdsourcing	The authors discuss the viability of MTurk for thematic code development and application. In the first phase, 227 participants with chronic back pain were recruited to code textual descriptions of back pain using four codes (duration, frequency, intensity, function), as well as provide feedback on the coding procedure. In the second phase, another sample of 250 participants were invited to code the textual descriptions using the revised codes developed in the first phase. The study found that there was a difference between how participants classified chronic pain and how it is classified by experts, suggesting that crowdsourcing can be helpful in drawing out new and unexplored perspectives from stakeholder participants. This has implications for evaluation.
Hites et al. (2013)	Journal article (Evaluation Review)	Empirical	GIS	The article details an evaluation study that was conducted using GIS and other kinds of data to inform university initiatives concerning student safety on a university campus. This method was helpful in providing an additional lens to analyze the data, and for revealing emerging patterns.

Citation	Document type	Research type[5]	Type of ICT discussed	Summary
IFAD (2017)	Conference proceedings (IFAD)	Grey literature	Various (Big data, GIS, social media, mobile devices, etc.)	This report summarizes the discussions had at the International Fund for Agricultural Development (IFAD) ICT4Eval International conference (June 6-7, 2017). The conference touched on various themes, such as big data in evaluation, prevalence of data mining and predictive analytics, and new modes of data dissemination. Lessons learned included the following: • A variety of tools are now accessible to evaluators • These tools alone are not a solution, but must be used cautiously • Evaluations must remain human-centric, both in who produces them and who they are meant to serve • The future of evaluation as a field will likely rely on new partnerships, such as that with technology experts, and with the ever-growing big data community
International Bank for Reconstruction and Development / The World Bank (2017)	Report (The World Bank)	Grey literature	Various (information management systems, GIS, etc)	This exhaustive report details the scope of ICT use in the agricultural sector in developing countries, and includes 200 examples of various ICT applications. The report notes that evaluation of agricultural initiatives remains a challenge due to high costs, remoteness of sites, and so on. The authors note that ICT can be used in monitoring and evaluation by improving access to data and its accuracy, reducing dependency on pen-paper methods, and including remote farmer populations.
Jacobson, Whyte, & Azzam (2018)	Journal article (American Journal of Evaluation)	Empirical	Crowdsourcing	This article describes findings from a research study that assessed the viability of the MTurk workforce to effectively quantize qualitative data. Quantizing refers to the process of translating qualitative text into numbers. The exploratory study discussed in the article found that coding by 'Mturkers' was done with reasonable consistency in comparison to evaluator coders. Disagreement over the coding structure allowed evaluators to improve the coding scheme. Several questions remain such as those of confidentiality, cost-effectiveness, and complexity of the coding task, however the authors propose that crowdsourcing may nevertheless become a worthwhile option for evaluators.
Jamieson & Azzam (2012)	Journal article (Journal of MultiDisciplinary Evaluation)	Empirical	Various (mobile devices, digital multimedia, GIS, social media, etc.)	The authors conducted research on evaluation in attempt to understand what kinds of technology tools are being used by the evaluation community and what drives this use. Their findings suggest that evaluators use technology mainly to reduce costs and laborious aspects of evaluation, and reduce the possibility of error.

Citation	Document type	Research type[5]	Type of ICT discussed	Summary
Johnston (2010)	Journal article (Canadian Journal of Program Evaluation)	Conceptual	Digital multimedia, PhotoVoice	Using ICTs such as digital multimedia can be congruent with Aboriginal ways of knowing, especially youth. In the example provided, video was used to clarify the experimental program design to encourage youth's participation. The animated video relied on imagery and concepts that would be relevant for Aboriginal youth.
Jones et al. (2019)	Journal article (American Journal of Evaluation)	Empirical	Data visualization, crowdsourcing	The researchers used the crowdsourcing platform MTurk to collect data on six versions of a logic model to measure whether visual revisions affected efficiency, credibility, and perception of aesthetics. A total of 295 people participated in the study. The findings revealed that credibility and perception of aesthetics was higher for the revised logic model. Efficiency was also improved, as measured by the amount of time participants spent reviewing the logic model, their ability to understand it, and accurately recap the model's goal.
Kelly, Friederici, Minges, & Yamamichi (2012)	Report (The World Bank)	Grey literature	Various (mobile devices, SMS, GIS)	While this report is predominantly focused on using mobile technologies for development, the authors note the importance of recurring evaluation for gauging what works. The report notes the importance of mobile devices in improving citizen engagement, such as in the case of Ushahidi crowdsourcing platform which promotes citizen input. Data collection is also discussed, with the example of RapidSMS, a tool developed by UNICEF to improve efficiency in service delivery.
Less et al. (2015)	Journal article (Evaluation and Program Planning)	Empirical	GIS	This article discusses the use of GoogleStreetView (GSV) as a tool for neighbourhood audits, especially when in-person assessments are too difficult or expensive to undertake. The authors used GSV to examine the relationship between retail alcohol stores and the nearby neighbourhoods, and found high inter-rater reliability using GSV, suggesting that this tool can be used in producing credible audits.
Mason & Azzam (2019)	Journal article (American Journal of Evaluation)	Empirical	Data visualization, crowdsourcing	Using MTurk to collect data from 1425 individuals, the authors sought to empirically test a number of hypothesis related to attitude change and data visualization. The findings revealed that participants' prior opinions influenced their perception of the evaluation report the most. The study found that more visual reports were perceived more negatively than those that relied on narrative, signaling research on different users' preferences of data visualization is needed.

Citation	Document type	Research type[5]	Type of ICT discussed	Summary
Materia et al. (2016)	Journal article (Evaluation and Program Planning)	Empirical	Internet-based technologies (e.g., online surveys, information management systems, SMS, apps)	When it is appropriately matched to the participant population, technology can be useful for data collection, and help reduce error, burden, and increase response rate. Implementation of technology requires planning and testing. The article includes a description of a case study of a Clearinghouse parent education pilot. The pilot involved an extensive use of technology, including online surveys, SMS, and video. These tools were deeply embedded into the pilot program and their use was well received by the participants. Nevertheless, the authors detail a number of unexpected issues that surfaced throughout, including expired licenses, and users running into issues. This resulted in lessons learned for the Clearinghouse program staff.
Mulvey, Atkinson, Avula, Luckey (2005)	Journal article (American Journal of Evaluation)	Empirical	Information management systems	This article details the transition of a federal funding agency Substance Abuse and Mental Health Services Administration (SAMHSA) and its grantees to a web-based system for program performance tracking. With the aid of the system, data are entered by the grantees from remote locations across the USA, and are then made available for analysis and reporting.
Petersson, & Breul (2017)	Book	Conceptual/ Empirical	Big data	This volume consists of thirteen chapters that address the role of big data in program evaluation. The chapters discuss how big data is currently perceived, and what role this technology may have for the field in the coming years.
Picciotto (2020)	Journal article (American Journal of Evaluation)	Conceptual	Big data	This article discusses the evolution of big data, noting that evaluators have been slow to take advantage of these recent developments. The paper argues that building a symbiosis between evaluation and big data will be a critical next step both for evaluation and big data governance.
Pope et al. (2013)	Report (Idealware)	Grey literature	Various (e.g., information management systems, mobile apps, SMS, GIS, data visualization)	This report targets not-for-profit organizations and outlines a number of ICT tools that can be used for internal program evaluation. The report details numerous tools and offers guidance with how and when they may be used.

Citation	Document type	Research type[5]	Type of ICT discussed	Summary
Porter, Koch, & Henderson (2010)	Journal article (Journal of MultiDisciplinary Evaluation)	Empirical	Data visualization, data mining	The article describes a study that used relational database (in FileMaker Pro) to visualize teaching preparedness data and compared it against an established standard. This was done to visually map the teaching program's progress towards this established standard. The authors suggest that the resulting visualization can be a useful tool for stimulating conversation and enables stakeholders to participate in democratic decision making.
Purdue, Peterson, & Deng (2018)	Journal article (Evaluation Journal of Australasia)	Conceptual	Data collection with SMS	The authors note that due to the higher likelihood of young people using technology, using these tools to collect data may be a viable option for evaluators. The authors illustrate that data from youth were already successfully collected by United Nation Children's Fund (UNICEF) using SMS in a number of a countries. In this example, weekly polls were circulated to mobile phones of youth to obtain feedback on ongoing issues and projects.
Raftree & Bachan (2013)	Report (UNICEF)	Grey literature	Various (e.g., mobile devices, GIS, etc.)	The report centres on how ICTs can be used to support development strategies to support adolescent girls in developing countries. A number of issues are brought to light, including girls' potential lack of access to ICTs such as mobile phones. A number of case studies are included to showcase how ICTs have been used to promote the inclusion of girls' perspectives in issues such as safety.
Scharbatke-Church & Patel (2013)	Working paper (Besa/Tufts University)	Grey literature	Various (electronic collaborative tools, webinars, SMS, crowdsourcing, online surveys, GIS, mobile devices, etc.)	This working paper targets 'digital migrant' evaluators to consider using ICTs in their practice, specifically if their work is situated in conflict affected areas. The authors provide a comprehensive list of ICT options, and discuss a 5-point 'filter framework' that can be helpful in determining when best to use these tools.
Simister, James, & Scholz (2017)	Newsletter (INTRAC)	Grey literature	Various (e.g. crowdsourcing, mobile devices, remote sensing, digital storytelling, etc.)	Authors describe the range of ICT tools that made contributions to M&E over the past two decades. Technology is driving innovation in this sector though not without also contributing new challenges. The authors suggest that ICTs should fulfill an existing need, and that there should be financial capacity and support for using the tools.

Citation	Document type	Research type[5]	Type of ICT discussed	Summary
Schware et al. (2002)	Report (The World Bank)	Grey literature	Various (e.g., mobile devices, GIS)	This report focuses on the use of ICT for projects in developing countries. Examples of ICT applications include the use of mobile devices in telemedicine. These tools are said to have greatly improved data collection systems and reduced the reliance on paper filing.
Snow & Snow (2017)	Journal article (Evaluation Journal of Australasia)	Conceptual	Interactive logic modelling	This article documents the process for developing new interactive logic modelling software (Dylomo) for program evaluation. The software is intended to bypass some of the common issues with logic modeling, mainly inflexibility and confusing displays.
Sundar, Kasprzak, Halsall, & Woltman (2011)	Journal article (Canadian Journal of Program Evaluation)	Conceptual	Internet-based tools for evaluation capacity building (learning modules and webinars)	The authors suggest that web-based tools can be useful for building evaluation capacity, especially when this training is used in conjunction with other forms of learning. The case study discusses the use of online learning modules to help users plan and conduct evaluation, and then use evaluation findings; as well as webinars to engage with users on the topic of evaluation. Reduced cost and alleviation of geographical barriers were the noted benefits, while drawbacks included alienation of users who may not be comfortable with technology.
Vaca (2015)	Journal article (Journal of MultiDisciplinary Evaluation)	Conceptual	Crowdsourcing	Crowdsourcing can be made up of two components: crowdvoting (inquiring what the public's opinion may be on a matter) and crowdfunding (inviting the public to financially contribute to an endeavour). The author argues that this tool holds promise for evaluation. This may especially be the case for democratic evaluation approach where the objective is to coalesce conflicting views and construct valid and impartial conclusions. Since this approach is seen to be costly, crowdfunding via the Internet may be a viable solution for improving results, and accessing information cheaper.
Various **(1997)**	Journal issue (New Directions for Evaluation)	Conceptual	Data visualization	This journal issue offered guidance on specific visualization techniques, such as placement of bars and graph structure; and outlines key principles, such as crafting visualizations for a specific audience.
Various **(2007)**	Journal issue (New Directions for Evaluation)		Online surveys	This journal issue was dedicated to exploring the use of online surveys for the purpose of collecting evaluation data.

Citation	Document type	Research type[5]	Type of ICT discussed	Summary
Various (2004)	Periodical (The Evaluation Exchange)	Conceptual	Various (online surveys, multimedia, data visualization, etc.)	This periodical issue consists of a number of short articles that detail how ICT has been influencing the evaluation field. Various authors reflect on what value ICT can bring to evaluation, and note the importance of tailoring tools to the needs of the evaluation.
Various (2013)	Journal issue (New Directions for Evaluation)	Conceptual	Data visualization	This journal issue revisits the topic of data visualization and introduces evaluators to some new tools and novel approaches to data visualization, such as GIS and interactive data displays.
Vichta, Gwynner, & Collyer (2018)	Journal article (Evaluation Journal of Australasia)	Conceptual	Mobile apps for health and wellbeing tracking	The authors suggest that ICTs such as mobile wellbeing trackers may be helpful in evaluation projects focused on collecting data from disadvantaged youth, especially when used in conjunction with other face-to-face approaches.
Wade (1999)	Journal article (New Directions for Evaluation)	Conceptual	Internet-based data dissemination	Disseminating evaluation information online offered flexibility and wider reach than paper report dissemination, however the author expressed concerns regarding information being used out of context, or not for its intended purpose.
Watt (1999)	Journal article (New Directions for Evaluation)	Conceptual	Internet-based data collection tools (e.g., online surveys, web focus groups)	The author notes that Internet-based data collection offers several advantages for evaluation data collection such as reduced costs, and increased flexibility and speed. Successful use relies on compatibility of tools selected with the evaluation questions being asked, and the characteristics of the potential respondents.

Major themes in research on ICT in evaluation.

To date, research in this area has mainly touched on the subjects of using ICT for data collection and analysis (e.g., Azzam & Harman, 2016; Galloway, 2011; Materia et al., 2016), and as a pathway for disseminating findings (e.g., Jamieson & Azzam, 2012; Johnston, 2010; Vichta, Gwinner, & Collyer, 2018; Wade, 1999). With respect to ICT and data collection, organizations and practitioners working in international development are significantly further ahead of academic circles in examining how these tools can be beneficial to evaluation. This is evidenced by a number of reports published since the early 2000s by organizations such as the United Nations and the World Bank (see Scharbatke-Church & Patel, 2013; Schware et al., 2002), and private foundations such as the Rockefeller Foundation (see Raftree & Bamberger, 2014); as well as by conference proceedings from related conferences (IFAD, 2017). Collectively, these reports constitute a solid knowledge base of ICT applications for monitoring and evaluation. With respect to reporting stage of evaluation, there is evidence of a growing interest in data visualization techniques for the purpose of making evaluation findings digestible and actionable (e.g., Azzam, Evergreen, Germuth, & Kistler, 2013; Lysy, 2013). Lastly, a more recent strand of literature includes studies proposing a new role for evaluators as active technology developers. An example of this are the discussions on the use of the programming language R[6] in evaluation (Bar & Mentch, 2017), or evaluators developing their own apps for the purpose of evaluative inquiry (Materia et al., 2016).

Overall, these strands of literature frame the use of ICT in program evaluation practice in a positive light. Potential benefits that have been cited include diversifying data collection options for evaluators (e.g., Bennington et al., 1999; Materia et al., 2016; Vichta, Gwinner, &

[6] https://www.r-project.org/

Collyer, 2018), reducing costs and saving time (e.g., Azzam & Jacobson, 2015; Materia et al., 2016; Sundar, Kasprzak, Halsall, & Woltman, 2011), and promoting different forms of communication with various stakeholder groups (e.g., Corlazzoli et al., 2014; Scharbatke-Church & Patel, 2013; Wade, 1999). Examples of such groups include Aboriginal people (Johnston, 2010) and disadvantaged youth (e.g., Johnston, 2010; Purdue, Peterson, & Deng, 2018; Vichta, Gwinner, & Collyer, 2018). Nevertheless, most authors caution against overreliance on ICT, and suggest that these tools are implemented in tandem with other 'low-tech' tools (e.g., IFAD, 2017; Scharbatke-Church & Patel, 2013; Sundar et al., 2011; Vichta, Gwinner, & Collyer, 2018). My review suggests that this can be due to a number of reasons. For example, in a case dealing with vulnerable and disadvantaged youth (Vichta, Gwinner, & Collyer, 2018), the authors found that 'trust-based interpersonal communication' (p. 230) helped to cement participants' link to the services provided, while technology eased other aspects of service delivery. In this particular case, these authors found that a 'technology-based qualitative methodology' (p.230) was the optimal symbiosis that fit that particular context. In a different case that used web-based learning platforms for evaluation capacity purposes, participants similarly expressed a need for face-to-face contact in order to consolidate participants' learnings (Sundar et al., 2011). Challenges can also arise when participants are not truly comfortable with technology but are asked to use it (Poth, Pinto, & Howery, 2012; Sundar et al., 2011). In these cases, the authors noted that technical issues and human error can be especially frustrating and can contribute an unnecessary roadblock for the evaluation.

The use of ICTs also invite questions about ethics, such as accessibility, privacy and confidentiality of data, and these issues are ongoing concerns, cited widely in both academic and grey literature (e.g. Azzam & Robinson, 2013; Bamberger, Raftree, & Olazabal, 2016;

IFAD, 2017). Despite ongoing and unprecedented technological acceleration has, for some vulnerable populations, a digital divide continues to exist and cannot be taken for granted. For example, Raftree and Bachan (2013) noted that in many developing countries, reliable data on girls' access to mobile phones or the Internet are still difficult to find, and thus it is not clear if and how this group is benefitting from ICTs. This may be tied less to availability of ICTs than to barriers embedded in these contexts (IBRD/The World Bank, 2017) such as low rates of schooling, poverty, gender, discrimination, or geographic inequalities (Raftree & Bachan, 2013; Simister, James, & Scholz, 2017). Nevertheless, these social factors are intertwined with issues of access, and must be considered by evaluators deliberating their use. How and where the data are stored is also key, especially for contexts where privacy invasion may cause harm or endanger participants (Bamberger, Raftree, & Olazabal, 2016). In some cases, raising awareness about these challenges is helping pave way to circumventing them. For instance, certain techniques of GIS can be used to protect participant privacy, such as by obscuring exact addresses from the data display and revealing data in a more 'zoomed out' manner, by focusing on larger territory or neighbourhood (Azzam & Robinson, 2013). On the whole, issues of "consent, safety, security and confidentiality" (Bamberger, Raftree, & Olazabal, 2016, p. 241) are persistent elements in these discussions. Another notable barrier is feasibility. For example, with respect to mobile devices, it may be challenging to collect data in rural areas where there may be no signal for SMS collection and internet connection may be similarly unreliable (Belden et al., 2013). New ICT solutions are being developed to overcome this, such as free software 'Connect Online Connect Offline' (COCO)[7] that allows for offline collection of data, including photos and videos from the field (Belden et al., 2013). Altogether,

[7] https://www.digitalgreen.org/coco/

these issues underscore another major theme in the literature, that ICTs cannot be adopted with a 'one-size-fits-all' mentality. On the contrary, one theme to emerge from the studies is that the power of these tools relies on careful deliberation. Thus, rather than treating technology as a sole solution, evaluators should regard it as "*part* of the solution to *some* challenges" (Corlazzoli et al., 2014, p. 9, emphasis in the original).

To summarize, despite a research knowledge base of limited robustness, we can conclude that all stages of evaluation – from the way data are collected during an evaluation, to analysis, and dissemination of findings – can be affected by emergent technologies. An in-depth review of all tools that may be available is simply beyond the scope of this review, therefore the following discussion will focus on some of the most commonly referenced developments that pertain to the field of program evaluation. It is also worth noting that certain tools noted below can be used at multiple stages of an evaluation project, and therefore are not limited to a specific stage of evaluation.

Mobile technologies.

Given the growing availability of mobile technologies, the presence of these tools in evaluations is now relatively commonplace. These include but are not limited to: the use of phones for SMS for simple surveying and polls[8]; tablets and smartphones for longer, in-depth questionnaires; and digital pens for capturing handwritten notes and storing them digitally. The use of mobile technologies have the potential to improve evaluation data collection processes in a number of ways. This includes the ability to produce much larger amounts of data, and do so quickly and more reliably than traditional methods that are more likely to permit human error in

[8] These typically entail questions with simple answer options, such as 'Yes'/'No', or 'Choose A, B, C, D'.

completion and processing (e.g. paper and pencil questionnaires). For example, VOTO Mobile[9] used SMS and interactive voice response (IVR) to reach communities that would otherwise be too remote to contact in person, resulting in collection of data from millions of people across dozens of countries (Bamberger, Raftree, & Olazabal, 2016). This approach was later found to be more efficient and cheaper than a standard survey to implement by more than ninety percent (Bamberger, Raftree, & Olazabal, 2016). There are also now a number of free and open-source SMS platforms, such FrontlineSMS[10] and RapidSMS[11] (Colville, 2013). Besides sending out SMS prompts to collect data, certain platforms are also using this technology for crowdsourcing (discussed in further detail below) to allow individuals to continually contribute to existing data by offering their real-time input, such as by reporting incidence of violence that can then be investigated (Colville, 2013). Mobile technologies are also enriching the kind of data evaluators are able to collect. For example, using devices as part of the PhotoVoice[12] methodology can help participants capture powerful images that not only encapsulate their experiences, but also enrich the evaluation with an alternate line of evidence.

As some authors have noted (e.g., Belden et al., 2013; Materia et al., 2016; Raftree & Bamberger, 2014), using mobile technologies requires planning in order to address any potential issues before they arise. This includes ensuring, pre-emptively, that mobile technologies are the best fit for the data being collected, and for the organization that will work with and use these data (Belden et al., 2013). For example, accessibility and connectivity are important challenges to consider. Costs must also be estimated for not only hardware but other elements that may not

[9] VOTO Mobile is now known as Viamo.
[10] https://www.frontlinesms.com/
[11] https://www.rapidsms.org/
[12] https://photovoice.org/

immediately be apparent. These can include costs for "database hosting, management, training, and fees for SMS or data transmission services, [which] range in price" (Belden et al., 2013, p. 15). In that sense, the largest cost of technology implementation may in fact be associated with human involvement – such as that of managers, designers, and trainers (Belden et al., 2013). Translating data into meaningful findings also requires human capital (Belden et al., 2013). Nevertheless, ICTs may allow for data collection in areas that would otherwise not be accessible to evaluators due to security issues and other challenges. For example, with the aid of mobile devices, GPS-enabled cameras, and Skype, Save the Children was able to collect data from a restricted region in Somalia by (Humanitarian Practice Network, 2016; IFAD, 2017). Predicted growth in mobile device access among young people in developing countries indicates that this ICT may help evaluators include more marginalized voices the evaluation process (Raftree & Bachan, 2013). With this increase in reach, there may be emerging opportunities for evaluators to enrich the practice.

Crowdsourcing.

The topic of crowdsourcing in evaluation is still somewhat sparsely developed. At the present time, principal peer-reviewed evaluation journals house only ten studies on this topic, however more studies are set to be released in the near future, as indicated by some of the authors of these studies. The studies published to date suggest that crowdsourcing may become a viable option for evaluators to obtain large amounts of data, and do so relatively easily and cheaply.

Crowdsourcing is made possible by the continued growth of the Internet and the

proliferation of funding platforms such as Kickstarter[13]. Its purpose is to export otherwise expensive or arduous labour to online participants who complete these 'human intelligence tasks' for free or a small sum (Vaca, 2015). This can include providing feedback on a website or document, translating text, or tagging images (Azzam & Jacobson, 2013). Crowdsourcing, through crowdfunding, can also bring in small financial contributions for completion of projects or endeavours (Vaca, 2015). In the context of evaluation, crowdsourcing is already being discussed seen as a viable option for several approaches, such as democratic evaluation (Vaca, 2015) and theory-driven evaluation (Harman & Azzam, 2018). Democratic evaluation is an approach where the evaluator is seen to serve a large population or the whole community. It can be longwinded and costly to conduct, but crowdsourcing is a possible means to reduce these costs by potentially appealing to the mass public to support evaluation endeavours fee by volunteering their time (Vaca, 2015). Similarly, given that Kickstarter already helps fund projects in a number of creative projects, evaluation projects may too be able to obtain 'crowdfunds' to undertake costly evaluation activities that would otherwise be too expensive to undertake (Vaca, 2015). Theory-driven evaluation looks in-depth at linkages between program activities and expected outcomes, and by collecting the data on implementation, tests where the program theory did not hold true (Harman & Azzam, 2018). For this approach, crowdsourcing could be utilized for coding transcript data (Azzam & Harman, 2016), easing the burden that evaluators using this approach may face. Other opportunities include, for example, collecting feedback on a quantitative survey instrument; paying a certain population to obtain comparative data for an evaluation study (Azzam & Jacobson, 2013; 2015; Jacobson & Azzam, 2018); obtaining feedback on data visualization used in evaluation (Azzam & Jacobson, 2015), or

[13] www.kickstarter.com

facilitating qualitative data collection by paying participants to code short answer responses from questionnaires (Hilton & Azzam, 2019; Jacobson, Whyte, & Azzam, 2018). Recent research has shown that crowdsourced data from Amazon's MTurk[14] can be statistically comparable to data obtained from college samples (Mason & Azzam, 2019), further highlighting the potential of this approach for evaluation. Beyond tried and true methodologies, crowdsourcing may also be a testing ground for trying novel approaches and simulation studies, thus contributing to further research on evaluation (Azzam & Jacobson, 2015). Some limitations of crowdsourcing must be noted. For example, the demographics of crowdsourced participants may not always be suitable for a given study: participants from MTurk, for example, are typically well educated and tend to be younger (Azzam & Jacobson, 2013). For research on evaluation, crowdsourced participants can also differ from evaluation stakeholders in that their input on evaluation-related matters would be abstract as opposed to rooted in actual experiences with the program (Mason & Azzam, 2019). Ethics, too, are an issue, and measures must be taken to protect and respect participant privacy (Azzam & Jacobson, 2013).

Geographic Information Systems (GIS).

According to the National Center for Geographic Information Analysis (NCGIA), geographic information systems (GIS) are "hardware, software, and procedures designed to support the capture, management, manipulation, analysis, modeling, and display of spatially referenced data for solving complex planning and management problems" (Griffiths, 2012, p. 442). Geographic information systems (GIS) allow for combination of different forms of data,

[14] https://www.mturk.com/

such as crowdsourced data (Scharbatke-Church & Patel, 2013), into detailed visual maps.

These maps can be useful in a variety of ways and be employed at different stages of program development (Azzam, 2013; Azzam & Robinson, 2013). For example, GIS can be used to identify optimal sites for carrying out the intervention; in monitoring, to identify how well the intervention may be working; or to improve quality of data needed for performance measurement (Azzam & Jacobson, 2015). Its principal advantage lies in mapping "contextual data in a visual manner, enabling users to detect patterns in a program and its surroundings" (Azzam & Robinson, 2013, p. 220). They can also be particularly useful for evaluating environmental impact due to their ability to capture a bird's eye view of a specific region (IFAD, 2017). There is an interest in this tool in the evaluation community, as gauged by the number of recently published studies in evaluation journals that utilized GIS as part of their methodology (e.g., Batsche & Reader, 2012; Baig, Shaw-Ridley, & Munoz, 2016; Hites et al., 2013; Less et al., 2015).

Data visualization.

Data visualization is a quickly growing field. Its main preoccupation is with visual representation of information or 'data', such as quantitative and categorical data (Friendly, 2009). While seemingly a new phenomenon, this field is a modern culmination of evolutions in studies such as cartography, surveying, navigation, astronomy, and early statistical graphing (Friendly, 2009). The contemporary era of data visualization relies heavily on advancements in software, while still serving as an interdisciplinary crossroads between domains such as graphic design, social science, among others.

In the field of program evaluation, interest in data visualization has generated an ever-

increasing interest. This may be owed to an ongoing reform wherein practitioners and scholars have begun to adapt data visualization techniques to add clarity, aesthetic value, and relevance to evaluation findings in an effort to improve consumption of evaluation findings. In many ways, this entails relying on best practices within the field and drawing boundaries around what was, and remains, a huge and often complex science. As such, data visualization in the context of program evaluation is principally concerned with using qualitative or quantitative data to generate images that can then be used the purpose of "exploration, examination, and communication" (Evergreen & Metzner, 2013, p. 9). In 1997, a volume tackling issues in graphical representation of data was published in *New Directions for Evaluation*. In 2013, the same journal published a follow-up volume on data visualization which examined the subject by drawing on rapidly evolving technologies not yet available less than two decades before. Evergreen and Metzner (2013) noted that in a field such as program evaluation, where communicating information is one of the chief objectives, mastering data visualization is especially significant. They explain,

> The effort we put into making data visualizations more interpretable pays off in more efficient engagement with the products of our evaluation endeavors. Thus, including the process of simplification and emphasis in our evaluation practice is an investment in and commitment to the learning needs of our primary intended users (Evergreen & Metzner, 2013, p. 18).

It has been noted by Tufte (1997) that failure to thoughtfully consider data visualization principles can result in poorly understood data, and potentially lead to the wrong conclusions (Jones et al., 2019). Given the longstanding importance of studying evaluation use, the call to include more thoughtful visualization was well received by the practitioner community, as it was made apparent by numerous workshops offered at the American Evaluation Association conference since the formation of the Data Visualization and Reporting Topical Interest Group (TIG) in 2010-11. However, what constitutes a good visualization practice, and what works for

whom and when still remains a matter of debate, as a number of studies point out (e.g., Mason & Azzam, 2019).

Interactive logic modeling, theories of change (ToC), and concept mapping.

As defined by Bickman (1987), a logic model is a "plausible and sensible model of how a program will work under certain environmental conditions to solve identified problems" (McLaughlin & Jordan, 2010, p. 56). A logic model is typically divided into categories of inputs, activities, outputs, and outcomes (short-term, intermediate, and long-term), and is intended to graphically represent the approximate sequence in which the program functions. In that sense, it can be a helpful tool for visualizing day-to-day tasks, the assumed causal relationships, and contextual elements (Alkin, 2011; McLaughlin & Jordan, 2010). Nevertheless, some logic models can be somewhat overwhelming for stakeholders to view and work with, given a visually intimidating number of boxes and arrows they contain (Snow & Snow, 2017). This can especially the case if certain stakeholders did not participate in building the logic model and are viewing visual products thereafter (Hutchinson, 2017). Other elements, such as feedback loops that may occur as part of the intervention, cannot easily be represented in a static logic model format. Until recently, visualization aspects of logic models have been neglected in favour of other attributes, such as content and logical flow (Jones et al., 2019). There is also significant lack of empirical insight into how visual complexity of logic models – number of boxes, and so on - relates to their perceived usefulness (Delahais & Toulemonde, 2012; Jones et al., 2019). In the recent decade, theories of change (ToC) have emerged as an alternative to conventional logic models (Archibald, Sharrock, Buckley, & Cook, 2016). As an approach, a ToC can be defined as

a "guiding framework for all stages of thinking, action and sense-making when [intervening] intentionally in social change processes" (van Es, Guijt, & Vogel, 2015, p. 12). It is used to surface assumptions about how a program is meant to work, as well as consider alternative explanations that may otherwise be overlooked. Recently, Sridharan and Nakaima (2019) argued that ToCs can and should also emphasize sustainable pathways and mechanisms that contribute to program outcomes in the long-term, an aspect that, they argue, is not currently included in most frameworks. Mayne (2015) provided a synthesis of various ToC models, and outlined a number of principles important for their development. These include participatory work with stakeholders to develop the ToC, and a focus on iterative development (Mayne, 2015). As such, a ToC is said to be more of a process rather than a product, requiring "ongoing consultation, deliberation and collective decision-making that in itself has value for the design and implementation of complex development interventions" (Archibald et al., 2016, p. 120), which can make them a useful vehicle for evaluative learning and evaluation use.

At the present time, at least 8 options for modeling activities are available, including software applications from eDraw[15](including MindMaster[16]), DoView[17], Freeplane[18], to name a few (Snow & Snow, 2017). Developed with an insight from a program evaluator, the software Dylomo[19] was created in order to reduce misunderstanding and make logic strands easier to follow for stakeholders (Snow & Snow, 2017). This speaks to the ongoing need to refashion evaluation tools to better fit stakeholder needs, however the degree to which this has been successful has not been empirically substantiated. Much of the software available for logic

[15] https://www.edrawsoft.com/
[16] https://www.edrawsoft.com/mindmaster/
[17] http://doview.com/
[18] https://freeplane.en.softonic.com/
[19] https://dylomo.com

modelling can also assist with ToCs and concept mapping, however there are significantly more options available for the latter.

"Both logic models and concept maps share an approach to making the complex accessible through pictures but differ in how these visual images are generated and what is portrayed" (McLinden, 2017, p. 295). While logic models illustrate the pathways through which the program or project might accomplish its goals, concept maps reveal "how a group thinks about a particular issue" (Goldman & Kane, 2014, p. 16). Concept maps can also help draw attention to spheres that may be of interest to stakeholders, and consequently help the evaluator develop evaluation instruments that measure those spheres (Goldman & Kane, 2014). Described by Trochim (1989a), to construct a concept map, the group of participants generates ideas through discussion and identifies interrelationships between them before this information is then mapped using multivariate statistical techniques. At the time that this process was pioneered in the late 1980s, ICTs in the form of software for visualization was limited to standard statistical packages such as SAS and SPSS (Trochim, 1989a). In that sense, concept mapping could be a useful process for both the planning (through brainstorming) and analysis stages (through revisiting concepts and interlinks). More recently, a number of alternative visualization tools have emerged. Some examples include tablet apps such as Popplet[20], a tool used predominantly in classrooms; or online tools such as Coggle[21], which can be accessed via the browser without the need for software installation; however, more continue to be released. The hypothetical benefits of these emergent tools include greater ease of use, attractive visuals, and the power to visualize brainstorming sessions on the fly. However, the major difference, as noted by Trochim

[20] http://popplet.com/
[21] https://coggle.it/

(2017), is de-emphasis on the scaling of statements provided by participants, making some of the emergent tools more suitable for discussion sessions with stakeholders rather than systematic analysis. In that sense, while it was once described by Trochim (1989b) as a union of 'soft science and hard art', most readily available tools can turn concept mapping or ToC development into 'soft art'. One such exception is the open source software R, which necessitates coding knowledge, but is free, accessible, and powerful in its capacity as tool for concept mapping (Bar & Mentch, 2017; McLinden, 2017).

Social Media.

Social media are defined as "forms of electronic communication (such as websites for social networking and microblogging) through which users create online communities to share information, ideas, personal messages, and other content (such as videos)" (Merriam-Webster, 2020). At the present time, Facebook, Twitter, YouTube are examples of the most commonly used social media outlets, with millions of unique daily visits worldwide.

There has been increased interest in exploring how social media may be used as a resource for research (Batrinca & Treleaven, 2015; Brooker, Barnett, & Cribbin, 2016). With respect to academic publications, social media use in evaluation nevertheless remains a vastly unexplored domain. Several gray literature sources (see Corlazzoli et al.,2014; Dette et al., 2016) discuss the use of social media in evaluation of peacebuilding programmes, highlighting the potential of social media analytics in gathering near real-time information and sentiment measurement in conflict zones (Corlazzoli et al., 2014), as well as in providing a venue for collecting feedback from programme participants (Dette et al., 2016). Nevertheless, a number of challenges remain, such as selection bias, trustworthiness of information, and security and

privacy of users" (Corlazzoli et al., 2014, p. 22). Dependency on third parties, such as social media providers, has also been noted to be an impediment to use (Dette et al., 2016). For example, each platform has "specific rules around how their data can be stored and used" (Batrinca & Treleaven, 2015, p. 102). Analysis of social media data can also be complex, requiring new skills and competencies that are not currently discussed in the evaluation field, as I will discuss next.

Big Data.

Although it is largely underdeveloped, big data is a topic that lingers on the margins of the evaluation world but has the potential to soon become highly relevant to the field (Petersson et al., 2017a). One of the characteristics of the modern day world is the enormous production of digital data on a routine basis. The scope of these data is profound, and their application is widespread: governments, businesses, not-for-profit organizations, and ordinary citizens now all engage in the production and consumption of data. For example, from massive healthcare infrastructures, to traffic patterns on busy roads, to purchases made from online shopping hubs – billions of bits of data are recorded and stored on a daily basis (Lefebvre-Nare, Lemire, & Petersson, 2017). The sheer volume of this ongoing production is one of the reasons why the aptly-named 'big data' is so distinct - it carries the promise to transform the world from being data-scarce, to abundantly data-rich (Kitchin, 2013).

Despite being a fairly new development, a number of big data definitions already exist. None of these are currently universally accepted (Jin, Wah, Cheng, & Wang, 2015). In tandem with rapid technological change that defines the big data movement, some of these definitions are emerging from industry long before they are discussed in academic circles. In their work to

consolidate diversity among existing definitions, Lefebvre-Nare et al. (2017), noted five broad ways in which big data is currently being discussed and deliberated. These are: (1) as a disruption to traditional data processing; (2) as data-driven decision-making; (3) as a continuous storing and processing of large volumes of data; (4) as a cultural movement; and (5) as the absence of human interpretation (p. 20). Kitchin (2013) also described big data as being high in volume, velocity, and variety; exhaustive, detailed and fine-grained; as well as flexible and scalable. Of these characteristics, the emphasis on volume, velocity, and variety are commonly encountered in literature defining big data (e.g., Hilbert, 2016, Jin et al., 2015). *Volume* implies the cumulative amount of data created, whereas *velocity* denotes that these data are being created in real time (Kitchin, 2013). Lastly, *variety* points to the diversity of these data as they are often both structured and unstructured (Kitchin, 2013).

The challenges that arise from big data is that there may be simply too much of it for us to make any sense of, as traditional statistical approaches may no longer be suited (Fan, Han, & Liu, 2014; Kitchin, 2013). Sophisticated modelling techniques are required, implicating measurement practitioner specialists. Generally, such skillsets are beyond the norm of most practicing evaluators. There is also the risk of drawing incorrect conclusions, given that different kinds of data are aggregated and analyses are run between unrelated covariates (Fan, Han, & Liu, 2014). New skills to analyze these data are required, including “basic coding, modelling, and simulation” (Kitchin, 2013, p. 264).

Big data may soon have a role to play in the field of program evaluation. This includes the potential to enrich analysis capabilities, and ultimately lead to higher quality, data-informed evaluation studies. Unlike traditional forms of data collection such as surveys and interviews, big data analytics can examine multiple sources of data simultaneously and do so in real time

(Mazzeo Rinaldi, Giuffrida, & Negrete, 2017). For example, in the sphere of international development where program evaluation is often employed, the United Nations' 'Global Pulse' initiative aims to utilise big data to predict poverty rates in community rates (Jin et al., 2015; Raftree & Bamberger, 2014). This entails that future programming administered by the United Nations and other social sector organizations may draw on data yielded from big data projects. This too has important implications for program evaluation.

Despite these promising directions, evaluators have been slow to adapt the big data trend (Petersson et al., 2017a; Petersson, F. Leeuw, Olejniczak, 2017b; Picciotto, 2020). In their survey of 85,000 evaluators conducted through the LinkedIn platform, Hojlund, Olejniczak, Petersson and Rok (2017) received only 324 responses, and of those, only 15 respondents stated that they used big data in their practice as evaluators. The remainder of the responses illustrated that big data is a not yet a concept that is well understood in evaluation, and it may not be seen as a useful tool, but instead as costly, time-consuming, and difficult to work with in a standard evaluation project (Hojlund et al., 2017). Issues of data privacy also arose as major concerns for respondents (Hojlund et al., 2017). A parallel literature scan conducted by the authors also found little to no discussion about big data in prominent evaluation journals[22] despite isolating thirty-five articles that touch on "design, implementation, and evaluation of public interventions" (Hojlund et al., 2017, p. 50). On the other hand, in a separate study of reviewing twenty-five Terms of References (ToR) from a number of international development agencies, Forss and Noren (2017) found that there was little to no incentive for evaluators to use big data. This was likely due to "institutional inertia, lack of capacity, and competence on how big data could be

[22] Two articles have since been published on the topic of big data analytics in the American Journal of Evaluation (see Finucane, Martinez, & Cody, 2018; Picciotto, 2020).

used" (p. 185). Thus, these authors suggest that the supposed benefits of big data may presently be out of reach.

Most authors recognize that big data is not without its faults. As noted by Kitchin (2013), "extracting useful, valid information from the data deluge and making sense of it is not simply a technical issue that can be dealt with by technological solutions alone" (p. 264). Kitchin (2013) also wrote,

> Big data may seek to be exhaustive, but as with all data they are both a representation and a sample. What data are captured is shaped by the technology used, the context in which data are generated and the data ontology employed. The world is vastly complex, and it is impossible to capture a whole domain and all of its nuances, contradictions and paradoxes (p. 265).

Evaluation too may have something to offer to the future of big data, as evaluators already have skillsets that can make sense of these data in a way that lends them to decision-making. Evaluators' interpretative skills and expertise in working with other forms of data can help to constructively navigate the deluge of big data, and uncover insights into what may be going on between the lines. Petersson et al. (2017b) noted that "evaluators' experience in working with program theory, theory of change, and social scientific theory" (p. 249) are indispensable skills that will remain valuable even data-driven approaches. Given that big data world is currently largely unregulated, evaluators may also add value by ensuring ethical use of these data (Picciotto, 2020).

It is not clear whether this emergent technology will be widely adapted in evaluation, but for some evaluation scholars, big data may be the inevitable next step. Referencing these developments, Gopalakrishnan, Preskill, and Lu (2013) also posed the following questions to the evaluation community:

> Would the availability of large amounts of data and the analytic engines that crunch the data make traditional evaluation designs and methods obsolete? Who needs sampling techniques when you can pretty much capture characteristics of whole populations? Why convene a focus group

> when you can just analyze Twitter feeds? Moreover, why hire an evaluator at all when a well-structured algorithm can draw the same conclusions? (p. 11).

These questions are not easily answered, but they invite contemplation and serve as an important reminders of the changing times ahead. Petersson et al. (2017b) also noted four important challenges that may arise for program evaluators in the coming years, if the field is to maintain competitiveness. These include: understanding how big data will affect the policy process; learning about how to adapt this technology for evaluation purposes; obtaining new competencies; and learning from other networks with an insight into big data (Petersson et al., 2017b). How quickly and how well these challenges will be met in practice may be a task for professional evaluation associations, a point I will return to in the final chapter.

Summary.

The focus of this review was to synopsize literature on ICT in program evaluation, and to provide a brief overview of some of the tools and applications used in practice. These examples included mobile technologies, GIS, crowdsourcing, data visualization, and interactive logic modelling and concept mapping software. Although, in general, the use of these tools is perceived as a benefit, a number of issues remain. These were framed both as technical issues, such as poor connectivity, and 'human-centric' issues, such as ethical considerations that continue to hamper widespread ICT use.

To summarize, although new developments in technology may be one of the most visible influences on how the evaluation work has changed (King & Alkin, 2019), research on ICT in program evaluation has not kept up in pace. Regarding new emergent technologies such as big data, research is especially sparse and uptake appears similarly slow. However, as noted above, several authors stress that evaluators may not only reap rewards from big data – they can also

help shape its future. This entails lending their evaluative thinking lens to help clarify what, amongst the sea of data, is of utmost importance.

Having situated this domain, I will now discuss the theoretical underpinnings of ICTs as a facilitator of evaluation use. This discussion will draw largely on social interdependence theory and its practical application, cooperative learning, and illustrate that this theoretical perspective can be a useful tool for thinking about use (King & Stevahn, 2013). The following section will provide a brief literature review of this theory before discussing its influence on the conceptual framework.

Cooperative Learning and Social Interdependence Theory

My aim in this section is to explore social interdependence theory in order to identify antecedents to learning, and to investigate the conditions necessary for use to take place in evaluation contexts. This will contribute to the integration of both areas of research into a single framework, which will be discussed below. Social interdependence theory can be of particular use when trying to understand what facilitates process use/learning (King & Stevahn, 2013). Understanding this theory can help evaluators to set the conditions that will help participants to "feel interconnected, motivated to work together, and committed to mutual success", such as co-defining tasks as well as facilitating communication and interaction (King & Stevahn, 2013, p. 53).

Since its development, the theory of social interdependence has been widely applied and researched (D.W. Johnson & R.T. Johnson, 2005, 2009). The theory stresses that promotive and cooperative relationships that are mutually beneficial are more likely to lead to learning (D.W. Johnson & R.T. Johnson, 1999, 2003, 2005, 2009, 2014). These promotive

interactions occur in situations when individuals engage

> in actions that increase the likelihood of each other's success in achieving the joint goal. It consists of a number of variables, including mutual help and assistance, exchange of needed resources, effective communication, mutual influence, trust, and constructive management of conflict (D.W. Johnson & R.T. Johnson, 2005, p. 292).

Promotive interaction is especially key to social interdependence, as without agreement to engage in promotive actions, cooperation is difficult to achieve (D.W. Johnson & R.T. Johnson, 2005).

The roots of social interdependence theory literature date back to early 20th century and stem from the work of Koffka who, while studying physics, reasoned that social groups are not unlike molecules and atoms, and are inherently bound by varying degrees of interdependence (D.W. Johnson, R.T. Johnson, & Holubec, 1994; D.W. Johnson, 2003). This notion was later expanded by Lewin (1944, 1947) who noted that when faced with common goals, members of groups would be equally affected, and thus would drive the group to work in a cooperative manner for the achievement of these goals. He noted that relations between parts defined their social structure, such as when individuals join forces to fight for a common purpose (Lewin, 1947). Without this common goal, the fabric of the group would not exist (Lewin, 1947). Building on this premise, Deutsch (1949) added value by developing a theory of cooperation and competition (D.W. Johnson et al., 1993, D.W. Johnson, 2003). In his (1949) work, he stated that positive interdependence results in cooperation, and negative interdependence in competition. When research participants felt a sense of cooperation, they worked together more frequently than those participants who were told to compete (Deutsh, 1949).

Over the years, empirical research has confirmed that cooperative experiences promote positive relationships, more social support, and "more frequent insight into and use of higher

level cognitive and moral reasoning strategies than do competitive or individualistic efforts" (D.W. Johnson, 2003, p. 937). This is attributed to the learners' natural tendency to build on each other's strengths and know-how (King & Stevahn, 2013). Conversely, being faced with competition "results in oppositional interaction as individuals discourage and obstruct each other's efforts to achieve" (D.W. Johnson et al., 1993). There is an assumption that members of a group are intrinsically motivated to cooperate, and this interaction is reinforced by their "joint aspirations to achieve a significant goal" (D.W. Johnson, R.T. Johnson, & Holubec, 1994, p. 15).

Social interdependence theory has most recently been advanced by D.W. Johnson and R.T. Johnson (e.g., 1994, 1999, 2003, 2005, 2009) who have written extensively on cooperative learning, the practical application of social interdependence theory in educational settings. Their work has suggested that cooperative learning results in educational process gain, that is, a higher-level reasoning and more capable generation of new ideas and solutions, and greater peer-to-peer knowledge transfer. This means that by working cooperatively, peoples gain access to more ideas, knowledge, and guidance than they would in isolation.

Traditionally used for informing educational practices, there is now an interest in applying social interdependence theory to studying organizational and managerial contexts. Tjosvold (1984, 1986, 1988) argued that interdependence dynamics were just as prevalent in organizations, where employees responded favourably to common goals, group tasks, and reward systems based on joint success. Research by Alper, Tjosvold, and Law (1998) showed that self-managing teams fared better when setting cooperative goals, as these improved group dynamics and fostered effectiveness. Similarly, Tarricone and Luca (2002) maintained that positive interdependence is one of the key elements of a successful business team environment.

Nevertheless, this theory is not without its shortcomings. For instance, the writings of Deutsch assumed that the learners in a cooperative learning environment have equal power (D.W. Johnson & R.T. Johnson, 2005) – something that we know to seldom be the case in evaluation contexts. In situations where evaluation serves an accountability function, it is often a mandated exercise. If stakeholders perceive evaluation as a nuisance or burden, a shared common goal that is believed to bind cooperative relationships may be lacking. On the contrary, stakeholders in such cases may choose to devote as little of their energy as possible. In other cases, evaluators too may lack power, or face pressure from client organizations.

As noted above, cooperation does not always happen organically but must instead be nurtured (D.W. Johnson et al., 1993; D.W. Johnson & R.T. Johnson, 1995; 1999; 2009), and positive interdependence must be operationalized (D.W. Johnson , 2003). This is also naturally the case for program evaluation. “Knowing the power of positive interdependence and applying it strategically to facilitate collaborative studies better enables those involved to build evaluation capacity and foster continuous organizational learning” (King & Stevahn, 2013, p. 53). In other words, facilitating and ‘setting the stage’ can be just as essential to learning as the lesson itself. It is here that ICTs may be of use to evaluators. When used efficiently, ICT may reduce the ‘cost’ of cooperation (D.W. Johnson & R.T. Johnson, 2005), that is, the effort it takes for the facilitator to maintain a cooperative environment. ICT can also offer immediate feedback, and “remove geographical and communication barriers that limit learning, [while fostering] engagement in inquiries that take place in any corner of the world” (D.W. Johnson & R.T. Johnson, 2014; Sundar, Kasprzak, Halsall, & Woltman, 2011). In the context of this theory, ICTs can be thought of as a supporting actor, providing important scaffolding for evaluators to enable collaboration.

To conclude, social interdependence theory asserts that mutually beneficial outcomes are more likely when actors share similar goals and interact in a manner that is promotive of those goals. There is significant intersection between social interdependence theory and concepts associated with evaluation use, hence the integration of these conceptual perspectives was complementary and appropriate for this thesis study. Social interdependence theory also "has a solid base of empirical support that emerged over the past century through social science inquiry" (King & Stevahn, 2013, p. 50). Since it has been widely studied, its use for theoretical guidance of this study is especially valuable. Below I discuss how these theories collectively influenced the conceptual framework that guided this thesis.

Conceptual Framework

The purpose of a conceptual framework is typically to (1) describe the state of known knowledge, usually through a literature review; (2) identify gaps in our understanding of a phenomenon or problem; and (3) outline the methodological underpinnings of the research project" (Varpio, Paradis, Uijtdehaage, & Young, 2019, p. 7). The conceptual framework is thus constructed, incorporating elements from existing theories (Maxwell, 2013). In the following section, I will discuss how the literature review I presented above informed the conceptual framework, and later explain the function that this framework will serve.

As I have attempted to show through my review on evaluation use, and particularly process use, the evaluator should prioritize learning, offer tools, and do their best to engage stakeholders (Levin-Rozalis & Rosenstein, 2005; Preskill & Torres, 2000). However, evaluators are not the sole drivers of learning. Even with facilitation, there is no guarantee that process use will occur (King, 2007) if the stakeholders are not equally invested, or have no

capacity for evaluation. Presumably, evaluative learning is thus driven (1) in part by the stakeholder (who must exhibit some readiness to engage), (2) in part by the evaluator who acts as a facilitator and must craft an appropriate environment for learning, and (3) and in part by the political, social, historical and economic context (which allows or hinders capacity). In many ways, this already mirrors what social interdependence and cooperative learning tell us about learning.

From the perspective of social interdependence theory, learning occurs in an interactive and interdependent environment (fostered by an instructor), particularly when the potential learners make an effort to learn, possess the capacity to do so, and feel that their relationships are positive (D.W. Johnson & R.T. Johnson, 1995, 1999; Tarricone & Luca, 2002). This dynamic is also present in evaluation contexts, where evaluation clients,

> whether organizational stakeholders or seekers of healthy psychological development, are responsible for their own growth, learning, and decisions will look upon the evaluator or counselor to encourage them to bring forth the issues that most concern them (Morabito, 2002, p. 328).

Figure 2 below provides a visual representation of the conceptual framework I adapted and will use to bound and guide the inquiry; this I will elaborate in the ensuing methods chapter. The three spheres represent each of the factors that lead to evaluative learning: (1) the influence and agency of the stakeholder over their learning; (2) the influence of the context within which the evaluation is taking place (allowing capacity); and (3) the influence of relationships between evaluators and stakeholders, which is determined by both of these groups. Evaluative learning takes place when these factors overlap. Conversely, if stakeholders exhibit no desire to engage in evaluative learning, or positive relationships fail to be established, and if the context does not allow for evaluative learning, the spheres pictured in the Figure move further away from each other, and learning is less likely to happen. Promotive interaction, pictured in the ‘inner cycle’

of the figure, represents the domain where there is "potential to foster a greater influence of the evaluation process" (Morabito, 2002, p. 328). It is also the cycle that drives evaluation use, and particularly process use. Although all actors in this process are responsible for engaging in learning, an evaluator is the one that can endeavour to make it strategic and intentional. Although actual promotive strategies may differ across contexts, evaluation literature offers a number of examples. For example, King (2007) noted that planning for process use:

> ... means systematically and purposefully applying the experiential learning cycle—that is, planning an evaluation activity, doing it and collecting information about it, and then reflecting on what happened as one plans next steps. If possible, every member of the organization needs to understand that evaluation is a part of his or her job description, and there is a structure in place to support people in learning about what this means (p. 53).

The above highlights the evaluator's responsibility for promotive interaction, while also highlighting that positive interdependence, as noted in social interdependence theory, can be a helpful mechanism for learning. Other examples of promotive behaviours can be drawn from ECB literature. Recently, Buckley et al. (2015) outlined six practical strategies for promoting evaluative thinking[23], which emphasize that this quality must be intentionally and habitually cultivated through continuous stakeholder involvement and collaboration.

The evaluator must use every tool in her arsenal to build this learning environment, and this toolbox, while trusty, could stand to benefit from recent developments in technology. The use of ICT, if appropriately integrated, would not necessarily run counter to the evaluator's role as a facilitator of learning, or to the group's need for promotive interaction. On the contrary, it has the potential to complement both of these functions. While ICT is not likely to replace the

[23] The strategies outlined by Buckley et al. (2015) include: "(1) creating an intentional learning environment; (2) establishing a habit of scheduling meeting time focused on evaluative thinking practice; 3) using role-play when planning evaluation work; (4) diagraming or illustrate thinking with colleagues; (5) engaging in supportive, critical peer review; and (6) engaging [users] in evaluation (p. 8). The authors expand on this by providing a list of activities that can support these strategies.

promotive interaction that should already be taking place in order for evaluative learning to happen, it has the potential to act as an aid to this process. Thus, what is not yet known, and is at the centre of this study, is whether using ICT as part of that promotive interaction influences process use, and the use of evaluations findings as well.

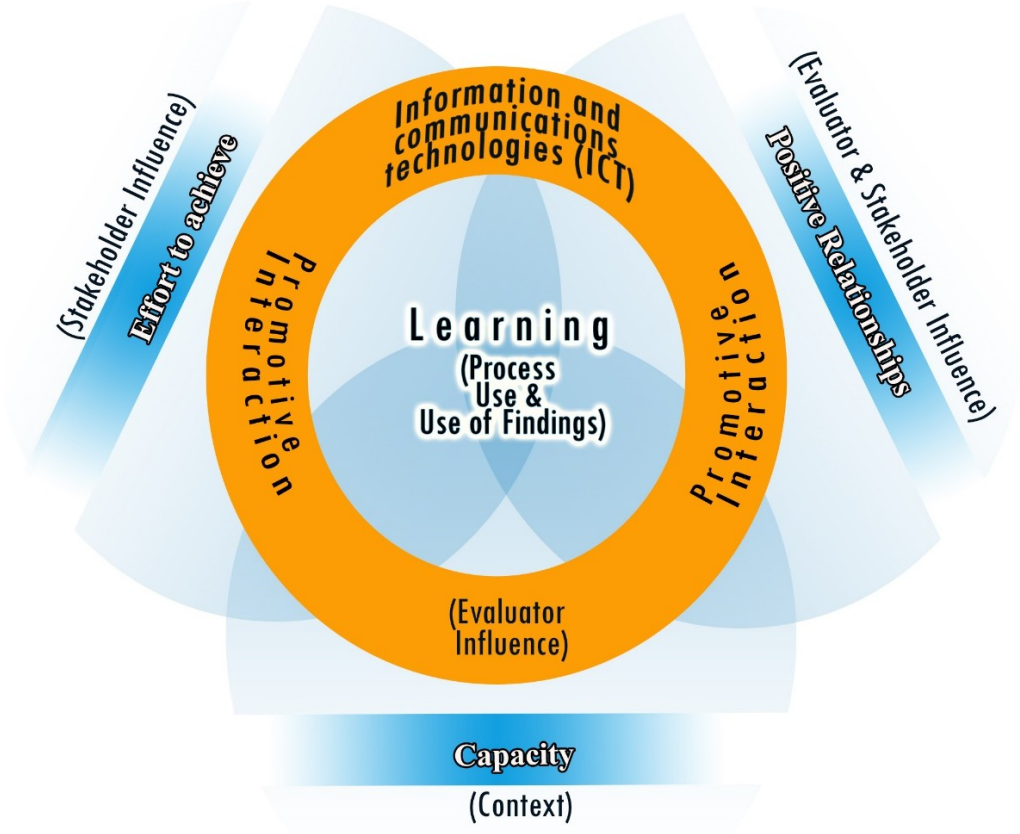

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Figure 2: Conceptual Framework
ICT as a pathway to promotive interaction that contributes to evaluation use
(Adapted from Johnson, D.W. & Johnson, R.T. 1999)

The research that follows aims to provide insight into what role ICT may play in program evaluation practice, especially in fostering evaluation use. Through empirical exploration, this study aspires to not only enrich our understanding of these issues, but to

encourage further inquiry. Continued insight is then likely to aid the program evaluation field in the coming years by keeping practitioners abreast of trends, while also deepening our theoretical understanding. For this reason, I chose to take the subjectivist inductive approach (Varpio et al., 2019), and build upon this initial conceptual framework to allow for room for new insights to emerge. In this manner, the conceptual framework serves a dual function – to guide this research, but also to continually evolve into a research output.

Chapter 3: Methodology

The following section details the methodology that guided this research. It begins with a discussion of the philosophical stance that guided this thesis study, and establishes my positioning as a researcher engaged in the study of the subject of ICTs. It then reviews the overall research design and details the sequenced nature of the research. Study 1 and Study 2 are then described in terms of participant samples, instruments used, data collection procedures and processes, and lastly, plan for analysis.

Philosophical Stance

I approached the research from the epistemological stance of critical realism (Maxwell & Mittapalli, 2010) aiming to construct a theory about uses of ICT in program evaluation practice, while acknowledging that any theory is also rooted in a specific worldviews. Realism tends to acknowledge that knowledge about this objective reality is socially and historically constructed (Miles & Huberman, 1994), therefore it is possible to build testable theories that "account for a real world that is both bounded and perceptually laden" (p. 4). Critical realism is seen as a middle ground between the positivist view that the world and reality are purely objective, and the radical constructivist perspective that poses that no single view of reality can exist when such views are inherently, internally constructed by the viewer (Maxwell & Mittapalli, 2010). In contrast, this philosophical position argues that although reality may be 'out there', social systems are too complex for it to be measured accurately (Easton, 2010). In a sense, reality evades precise measurement, and its truth remains obscured. As put by Easton (2010), this reality is not unlike an iceberg - "we see just the tip of an iceberg but that doesn't mean that the invisible three-quarters is not there or is unconnected to what we see" (p. 123). To battle this

tension, critical realists argue that 'truth' is always in the state of becoming, and that continuous critical discussion can further our understanding.

The stance of critical realism lends itself well to mixed-methods methodology, which I chose to employ for this study. Epistemologically, the purpose of Study 1 interviews was to delve into participants' experiences, and aim to understand how the use of ICT is influenced by their unique worldviews. These findings would be followed by the quantitative findings of Study 2, the purpose of which was to see how well Study 1 findings can be generalized across evaluation practice. From the stance of critical realism, these findings, when juxtaposed, would be able to present new knowledge about practices that are both rooted in participants' reality and experience, while also contributing to future discussions and research efforts.

Researcher's Position

I feel obliged to acknowledge that my interest in the use of ICT for my own future practice is what inspired me to pursue this research topic. As a researcher of the 'millennial' generation, my relationship with ICT may differ from many others' in that technology and all of its various facets have become ubiquitous in my everyday life. One aspect of ICT in which I have keen interest is data visualization. In my time at University of Ottawa, I have created a number of infographics to disseminate findings from various research projects. I am also familiar with digital storytelling apps, and am currently learning how to code in order to visually present data using R. Beyond these examples, I also consider social media to be a useful tool, and when used appropriately, a powerful means for audience outreach. In short, while ICTs are not the end-all and be-all, the opportunities they offer are, to me, worthy of exploration.

I therefore recognize that while I do not have a stake in the research findings, I have entered a project holding my own set of assumptions which pertain to how ICTs may be used in my own future evaluation practice. To restrain these assumptions, I have endeavoured to make the data collection instruments as neutral as possible, and to remain open to the possibility of my findings refuting the conceptual framework.

Research Sequence Overview

The research was carried out using a mixed-methods sequential exploratory design (see Figure 3). A mixed method study can be defined as "the collection or analysis of both quantitative and/or qualitative data in a single study in which the data are collected concurrently or sequentially, are given a priority, and involve the integration of the data at one or more stages in the process of research" (Creswell, Plano Clark, Gutmann, & Hanson, 2003, p. 165). According to Greene (2009), "mixed methods way of thinking rests on the assumption that there are multiple legitimate approaches to social inquiry and that any given approach is inevitably partial" (p. 325). Since using solely quantitative or qualitative data may be insufficient for the explaining the full scope of the issue, the aim of mixing methods in this thesis study to yield a more rigorous analysis (Creswell et al., 2003; Fetters, Curry, & Creswell, 2013; Greene et al., 1989; Greene & Caracelli, 1997). Lastly, a mixed-methods approach can also help offer "multiple viewpoints, perspectives, positions and standpoints" (R. B. Johnson, Onwuegbuzie, & Turner, 2007, p. 113), and help surface complexities that entrench human activities (Greene, 2009).

In the context of this thesis, the mixing of methods was done at the technical level, which entails gathering and "mixing" multiple types of data during analysis and interpretation stages

(Greene, 2009). Studies that utilize sequential exploratory designs begin with a qualitative component the results of which will inform the quantitative component that follows (Creswell et al. 2003). Given that there is only a limited number of studies on ICT and evaluation, the use of the exploratory sequential design is especially appropriate. Commencing the study with a qualitative component helps to structure quantitative instruments, which in turn provide insight how qualitative and quantitative findings may be interconnected (O'Cathain, Murphy, & Nicholl, 2010). Research participants for Study 1 were purposely selected from an online community of evaluation practitioners using intensity sampling method. Intensity sampling entails seeking "excellent or rich examples of the phenomenon of interest, but not highly unusual cases" (Patton, 2002, p. 234). The rationale for using intensity sampling was that this method allows the researcher to collect rich examples about a particular phenomenon while also get a sense of the successes and failures that may be encountered (Patton, 1990). This means that the chosen group of participants are able to speak about their varying experiences related to the same specific phenomena. However, despite the intense focus on the phenomena being studied, the cases themselves are not extreme (Patton, 1990). This method is suitable for the given study due to the specificity of its research questions, especially those focused on exploring participants' individual approach to ICT use. Since the conceptual framework focused on the role of ICTs in facilitating evaluation use, obtaining data from a sample of evaluators who actively use ICT and have the most knowledge about this topic was especially important. For Study 2, I used purposive sampling method to identify participants, since the objective was to study a select, but larger, group of practitioners who use or have used ICTs in their practice. I expressed these criteria in the survey invitation, and used two screening questions to further narrow the sample to focus on this specific subset of people.

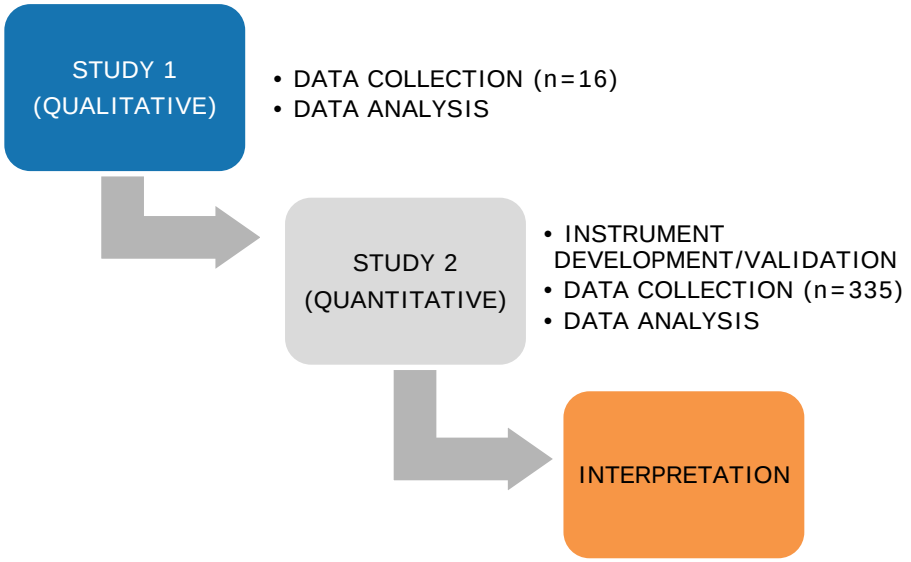

Figure 3: Summary of sequential exploratory research design

This design is especially useful for studying emergent phenomena (Morgan, 1998), hence it is especially appropriate for studying the ICT use as a facilitator of promotive interaction. This type of design is suitable for testing elements of an emergent theory qualitatively prior to supplementing it with quantitative data, and is useful for analyzing new and emergent phenomena (Creswell et al., 2003; Fetters et al., 2013; Morgan, 1998). This is especially the case if the research problem is qualitative in nature (Morse, 1991), which is the case for the thesis study. This entails that:

(a) the concept is "immature," due to a conspicuous lack of theory and previous research;

(b) a notion that the available theory may be inaccurate, inappropriate, incorrect, or biased;

(c) a need exists to explore and describe the phenomena and to develop theory; or

(d) the nature of the phenomena may not be suited for quantitative measures

(Morse, 1991, p. 120).

Study 1: Qualitative.

Although several in-person introductions were made at academic conferences and workshops (held at Canadian, American and European evaluation conferences), most of the official recruitment took place digitally. Prior to contacting the potential participants, their names, occupation, and area of research, including their connection to ICTs (such as references for ICT-centred articles written or presentations given at national evaluation conferences), were all compiled into a single spreadsheet. This helped ensure that the participants would provide sufficient insight for the study. In an informal e-mail, my thesis supervisor, Prof. J. Bradley Cousins, foreshadowed to potential participants that a formal invitation was coming and encouraged their consideration. The invitation (see Appendix A1) included information about the study, including purpose and description of information that would be sought from the participants. I then followed up with the prospective participant, more formally introducing the study and extending an invitation to participate (see Appendix A2 for the recruitment letter). I included a letter of informed consent (see Appendix A3) which briefed the participants on the focus of the study and commitment to ensure anonymity, given that the participants were selected from a fairly specialized group of practitioners. At this point, three people had declined the invitation, at which point they were thanked for their consideration, while another three did not reply to the invitation. For individuals who had agreed to participate, all returned had given their consent to participate, either by signing the form or by providing oral consent prior to the start of the interview.

The original design for the study aimed to collect data from both evaluation practitioners and their clients, creating a yoked sample of a total of twenty-four interviews, consisting of twelve evaluator – client pairs. Although I informed the evaluation practitioners of this research design during the recruitment process, ultimately, when the time came, most were hesitant to nominate a stakeholder participant, citing a variety of reasons such as staff turnover at client organizations and not wanting to burden their former clients after the project's end. After consulting my thesis committee, I was advised to carry on with data collection with the intent of collecting stakeholder data during the quantitative phase of the study.

The final sample consisted of sixteen participants from Canada, the United States, Belgium, and the Netherlands. Of these, twelve participants were purposely recruited for their tendency to actively use various ICT tools. Examples of the tools discussed are detailed in Table 2 below. 'Active use' entails any of the following criteria: writing academic journal articles about ICT in program evaluation practice, blogging about these issues, and presenting about ICT-related content at national evaluation conferences. The remaining four participants were recruited through snowball sampling. Eight participants were women and eight were male. At the time of interviewing, the participants were employed as evaluators in a variety of capacities, such as consulting (in education, health, and international development projects), and within the academic domain. This is also displayed in Table 2 below. In a few instances, participants were active in both of these capacities. Most of the participants were employed as external evaluators, while a small number were working in both capacities at the time, and shared their insights based on these experiences. Six participants explicitly referenced working on long-term projects, while the remainder made mentions of other short-term engagements from which they drew their

experience. This wide array of experiences offered unique perspectives on how evaluators from different walks of life engage with ICTs.

Table 2

ICT Tools Discussed in the Interviews with Participants

Participant	Role	Sector[24]	Scope of projects discussed	Communication	Data Collection	Data Analysis	Reporting
A	External	Multi-sector	International		Social media Mobile devices		Visual reporting
B	External	International Development	International		Mobile devices		
C	External	Education	International	Communication software			Visual reporting
D	External	Multi-sector	Local	Communication software	Mobile devices	System mapping	Visual reporting Visual/audio media System mapping
E	External	Community development	Local		Visual media (video)	Visual media (video)	
F	Both	Government	National		Quantified self Mobile devices	Big data	
G	External	Multi-sector	National		Tailored digital data collection systems		Visual reporting Web design/Digital strategy building
H	External	Industry	National	Communication software			Visual reporting
I	Both	International development	International		Visual media (video)		Visual media (video)
J	External	Government/ Health	National		Mobile devices		Visual reporting
K	External	Multi-sector	National			System mapping	Visual reporting System mapping
L	External	Education	Local	Communication software	Visual media (art and digital photography)	Visual media (art and digital photography)	Visual reporting
M	Both	Multi-sector	National				Visual/digital reporting
N	External	Multi-sector	National		Mobile devices	Qualitative analysis software development Big data	Visual reporting
O	Internal	International development	International		Visual media (digital photography)		
P	Internal	Education	Local	Communication software			Visual reporting

[24] As identified by participants at the time of the interviews.

The conceptual framework served as a foundation for drafting the interview guide. Influenced by the work of D.W Johnson and R.T. Johnson (1995, 1999) on social interdependence theory, the framework posed that ICT, in its various forms, has the potential to play a role in increasing learning in evaluation, but that it is only one of other factors that can affect evaluation use. Other factors outlined above were: the stakeholder's willingness to learn and engage in evaluation; positive relationships between the evaluator and the client; and context. I hypothesized that these factors are mediated by what D.W. Johnson and R.T. Johnson (1995, 1999) described as 'promotive interaction', an exchange between evaluation team members that, in this context, would be facilitated by the evaluator. It entails using various strategies and tools that are not limited to technology, but that work collectively to promote learning by teaching users about the ins and outs of evaluation through what has been coined as 'process use', or by increasing their learning of outcomes of the evaluation by what is referred to as 'use of findings.'

To answer the research questions outlined earlier, I prepared an interview guide (see Appendix A4) that consisted of three sections of questions that would help inform answers to the research questions (see Appendix A5 for the research question matrix). With aid from my colleagues in the PhD program and from several others in the Faculty of Education, I pilot tested this guide and adjustments were made with respect to wording, use of prompts, and sequencing of questions. I began the interview with a short preamble concerning the use of the term 'technology' and 'ICT', and explained to participants that in the context of this study, these terms may refer to both hardware and software, as well as processes that reinforced by technology. The purpose of this was to allow participants the freedom to express what ICT might mean to them, and concentrate on exploring the reasons for their use. While broad, this approach

to the definition reflected the literature in that 'ICT' is often framed as an umbrella term consisting of many possible tools. Focusing on a single tool would therefore detract from the explorative nature of this study.

Throughout the first section of the guide, I asked participants to discuss their lessons learned by drawing on a specific evaluation project that utilized ICTs. In the second section, I focused the exploration on participants' relationship with technology by exploring what barriers and facilitators to ICT use they have encountered in their practice. In the third section, I queried the participants' on their views on evaluation use. In the evaluation literature, use is often equated with learning and action, and is one of the chief motivations for continued research on evaluation, as I noted earlier. It is also an ongoing driver of professional development and a major topic of interest for evaluation societies and associations. The questions pertaining to use were aimed to uncover: what participants perceive as a 'useful' evaluation or how they know that use has occurred; what responsibilities are bared for use by all involved parties; and lastly, what strategies, with or without the use of ICT, they employ to encourage use in their practice. The purpose of this last section was to surface what approaches this group of practitioners, whose interest in technology sets them apart, takes in ensuring their practice is useful for their clients. I also saw this as a way to validate the conceptual framework, which saw learning as a result of a complex interplay between the individual and collective goals of evaluators and clients, as well as the context. As the interviews began to take place, I further fine-tuned the interview guide to improve the flow of conversations. Near the end of the interview process, I refocused the interview structure to allow participants to also talk about their evaluation practice, as this seemed to create a natural gateway for further questions. I also chose to ask latter participants to speak about ongoing trends concerning ICT use, and to speak to the future role of

evaluation professional societies in navigating ICT-related issues in future evaluation practice. The reasoning for this pertains to a number of barriers that participants voiced throughout the interviews, which made their insights into the future of ICT use in evaluation practice all the more valuable.

The data collection for the qualitative phase took place between November 2016 and March 2018. The interviews were, on average, one hour in length and took place over telephone or Skype audio, with the exception of one interview which was conducted in person in Ottawa, Canada. The interview data amounted to slightly less than sixteen hours in length. With each participant's permission, I audio recorded the interviews. At the beginning of the interview, I provided an oral preamble about the study and re-iterated that the participant's identity would be confidential and that he or she could choose to withdraw from the study at any time during the research process. In one instance, the recording software used for Skype audio failed to record the interview with a participant. I compiled a summary of the interview and submitted it to the participant for review and validation. However, the participant offered to be interviewed a second time ands a result, a second interview with the participant took place a month later.

I transcribed all of the interview data verbatim using InqScribe, and sent the transcripts to the participants for review and validation. Two participants returned the transcripts with minor corrections and elaborations. In one case, a participant offered answers to interview questions via e-mail as the participant had another commitment that required us to terminate the interview. The remainder of participants did not provide feedback. In November, 2017, I presented preliminary findings at the American Evaluation Association annual conference, using this opportunity to engage with not only my peers and colleagues, but also the general audience. This opportunity was helpful in honing my thinking on the emergent research.

The guide served as a starting point for deductively coding the data and forming organizational codes, whereas the second round of coding led to a more nuanced level of coding and thematic analysis. I used NVivo 11 for coding and analysis. To ensure data quality, I had maintained a digital journal to memo my coding process. Memoing is considered to be a valuable tool in qualitative research, and is aimed to serve multiple functions, such as "mapping research activities, extracting meaning from the data, maintaining momentum, and opening communication" (Birks, Chapman, & Francis, 2008). Memoing is also a way to increase reliability of data by engaging the researcher in the process of reflection and scrutiny, which helps to ensure that the findings indeed reside in the data as opposed to the researcher's beliefs Morse et al. (2002). For my memoing process, I opted to use a digital journal as opposed to memoing in NVivo due to its ease and flexibility. Within my journal, I memoed major changes to the coding structure, as well as my thought-process related to findings. Reflections pertaining to the research process as a whole were also added, and included my reactions about the interviews I conducted, and notes pertaining to the challenges I faced, such as those related to the recruitment of stakeholders.

The themes from Study 1 were highly emergent. By working with the data, linkages began to emerge, however I found that the findings were not always able to 'neatly' answer the research questions posed at the beginning of this project. Contrary to my expectations, the findings were in fact highly interconnected. To focus on the questions alone would disregard that ICT appeared to me to be interwoven into other important processes. This subtlety seemed important to capture, but created a challenge with respect to how best to present the findings in a manner that was both thorough and coherent. After consultations with my supervisor throughout the numerous iterations of the draft, I chose to communicate the findings as a thematic story, and

end with a short summary section that addressed the overarching research questions. It also became apparent that as findings began to emerge, the conceptual framework was also revised to reflect these findings. This ongoing engagement with the framework helped to ensure that the conclusions drawn were rooted in the theoretical underpinnings the conceptual framework first identified while also allowing room for my own conceptual reformulation.

Study 2: Quantitative.

Data collection for Study 2 began in the fall of 2018. I drafted questionnaires intended for both evaluator practitioners and stakeholders, drawing on Study 1 by ensuring that the instrument covered the components of the conceptual framework, such as evaluator and stakeholder roles, relationships, and perception of ICT's contribution to evaluation use, among others. In consultations with my research supervisor, I heavily modified and expanded these questionnaires. In order to obtain respondents' views on ICT's role in evaluation use, I also drafted a number of sub-questions measuring these constructs. For example, to measure 'process use', the questionnaire included questions pertaining to reducing burden on evaluation stakeholders, improving internal work processes, or helping stakeholders undertake their own evaluation projects. The reasoning behind this strategy was to query participants' perceptions of ICT in evaluation use without using these standard terms, and later use these components as part of a scaled variable. These scaled variables would also be used for further analysis.

I set up the survey to query participants about a specific evaluation project so that their responses could help inform about specific contexts in which ICT may or may not be relevant. By using the display logic feature of the Qualtrics platform (for online data collection), follow-up questions were contingent on options selected in the main question. For example, if a

participant stated that they used ICT for analysis, Qualtrics offered a follow-up question about what kinds of analysis tools were used[25], including an option that allowed text input. My intent was to keep the questionnaire concise with an option for obtaining more elaborate responses from certain participants without overwhelming the entire sample.

Prior to the pilot test, I shared the survey with a subject expert and their comments were used to further fine-tune the survey. I then pilot-tested the instrument several times by at least five colleagues at University of Ottawa who have knowledge of the program evaluation field, and their critique was used to inform the final version of the survey. This final version of the practitioner survey contained the following groups of questions (see Appendix B5):

- General views about ICT
- Specific project information such as scale or type of methodology used
- Frequency of ICT use, including follow-up questions related to specific tools
- Perceived value that ICT brought to the project
- Evaluator practices that do not pertain to the use of technology, such as following up with stakeholders after the project's end or investing time or resources into building an engaging environment for the stakeholders
- Stakeholders' knowledge of or level of comfort with program evaluation
- Views about the perceived quality of the relationship between the evaluator and the stakeholder
- Demographic information

[25] The options included were largely influenced by the kinds of ICT discussed by Study 1 participants.

The companion survey intended for evaluation stakeholders mirrored these questions in order to build a comparative view on the aforementioned topics. Both surveys and information sheets were translated into French in order to give an opportunity for participation for French-speaking evaluators belonging to the Canadian Evaluation Society as well as the European Evaluation Society. At this time I also submitted the survey instrument to the University of Ottawa Research Ethics Board (REB) for review, and obtained an ethics certificate to continue the study.

I sent an e-mail letter (see Appendix B1) to the following evaluation societies and associations:

- American Evaluation Association (AEA)
- Australasian Evaluation Association (AES)
- African Evaluation Association (AfrEA)
- Canadian Evaluation Society (CES)
- European Evaluation Society (EES)
- International Development Evaluation Association (IDEAS)

In this letter, I requested access to the member lists of these associations in order to disseminate the questionnaire, providing copies of the surveys and the information sheets (see Appendix B2) intended for evaluation practitioners who would be receiving the survey.

I received response from AfrEA, which ultimately meant that no data were collected from this association. Following a review, all remaining societies but the AES had agreed to support the direct dissemination of the survey. Due to privacy concerns, I was notified that AES does not share member information. I was nonetheless offered an opportunity to announce the survey in AES e-newsletter, however this form of dissemination ultimately yielded no survey responses. Both CES and AEA shared mailing lists of members who gave their consent to

participate in research studies. In the case of AEA, only partial access to membership was granted[26].

For CES and AEA, email invitations were sent to participants using the Qualtrics mailing platform, whereas EES and IDEAS members were sent an anonymous survey link to the survey. This link allowed any recipient to participate in the survey, however a Qualtrics feature 'Prevent Ballot Box Stuffing' prevents the same individuals from filling out the survey more than once by placing a cookie on their browser[27]. Two follow-up messages were sent to remind participants to complete the survey (see Appendix B3 and Appendix B4). On each occasion that they were contacted, recipients were provided an opt-out link that would allow them to unsubscribe from further project-related communication. The survey invitation also contained information regarding ethics approval for the study, and indicated that participation was optional and that all responses would be kept confidential.

A total of 335 responses were collected, of which 249 completed the survey in entirety[28]. It is difficult to estimate the response rate of the survey as not all individuals on society mailing lists are working as program evaluators. It is also difficult to know if all of the respondents successfully received the message as email addresses can become invalid if not used.

Once the survey had closed, all personal information such as name and email address was removed from the data and respondents were instead given numerical identifiers. With the

[26] According to the reviewing committee, this was done in order to prevent overburdening the members with requests to participate in research studies.
[27] A link accessed on a different machine could potentially allow multiple survey submissions by the same respondent. This is not likely to be the case for the survey discussed, given that no financial incentives were offered to participate.
[28] The survey used two questions in order to screen out participants who do not actively use ICT. Of the 335 responses, 27 participants were screened out. Of the remaining 308 responses, 59 were partially completed, resulting in 249 fully completed responses.

help of my doctoral supervisor, I then cleaned the data by removing excess categories[29], assigning value labels, and ensuring that Qualtrics had assigned correct values[30] to participants' responses. Throughout this process, we routinely discussed the approach to data cleaning and forthcoming analysis, and shared SPSS syntax files as changes were being implemented. While recoding variables, new variables were added to the master file to ensure that the original data were never overwritten. The analyses were conducted once the data were deemed sufficiently organized.

The majority of responses – just over 60% - were gathered from AEA members. This is not surprising, given that AEA currently retains the highest membership of all program evaluation societies. CES members contributed just over 25% of total responses. With the exception of few submissions from members of IDEAS, the remaining responses were collected from members of EES. Of all participants who responded, the majority identified as working in the education sector, followed by multi-sector employment, and international development (see Table 3 below for data on primary domain of practice). Given the prevalence of ICT use in this sector, this was somewhat expected.

[29] This refers to automatic data generated by Qualtrics, such as date and time of survey submission, etc.
[30] For example, in questions where the Likert scale of 1-5 was used, Qualtrics had erroneously assigned the values of 1, 3, 5, 6, 7.

Table 3
Sector of employment

Sector	N	Percent
Business and Industry	3	1.3
Community Development	15	6.4
Community Mental Health	4	1.7
Culture/Heritage/Tourism	3	1.3
Economic Development	3	1.3
Education	**55**	**23.6**
Health/Medical	15	6.4
International Development	**33**	**14.2**
Justice and Corrections	2	.9
Labour Market/Employment/Training	3	1.3
Public Health	23	9.9
Science and Technology	1	.4
Social Research	21	9.0
Social Welfare	16	6.9
Multi-Sector	**36**	**15.5**

As part of the demographic section, respondents were asked to identify their age and the number of years they had been working in the evaluation field. The findings (detailed Figure 4 and Figure 5) reveal that participants were generally older, with the majority of the respondents being over 35 years of age, and with those who were over 55 years of age being the most selected category. Years of experience was a category that was widely distributed. The largest cluster of participants had over 16 years of experience working in the evaluation field, while the lowest cluster noted that they have 11-15 years of experience. When asked to specify their

principal role, almost 80% (n = 249) noted that their capacity in the field was that of a program evaluator.

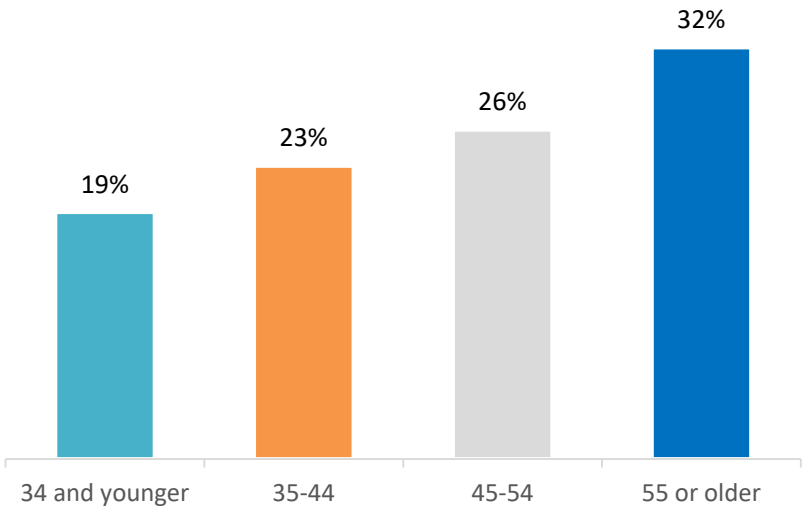

Figure 4: Age of participants (G2) (n=249)

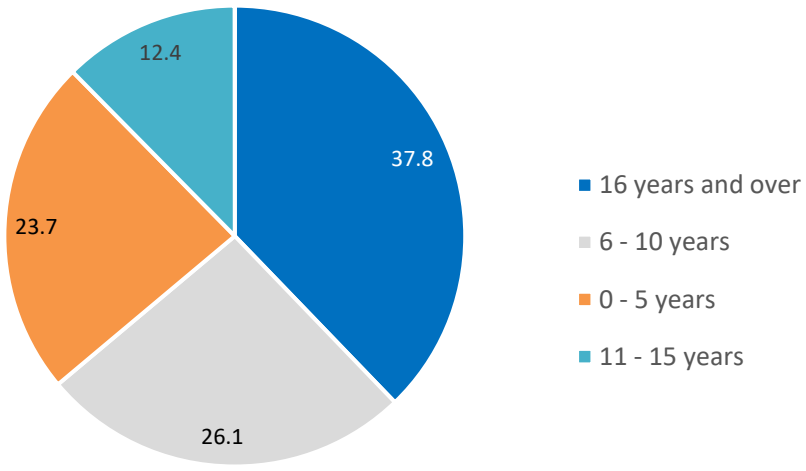

Figure 5: Years practicing evaluation (G3) (n =249)

Throughout the survey, participants were invited to contribute their perspectives by the way of three main open-ended questions related to the project context, unexpected consequences of ICT use, and participants' role as the evaluator of the program or project. The purpose of including open text options was to take full advantage of participants' feedback and add a degree of richness that would might have otherwise been obscured by the quantitative character of the instrument. To analyze these data, documents containing the feedback to these questions were integrated into the qualitative research software NVivo 12 from where coding and thematic analyses took place. This included a thorough consideration of the comments, followed by three rounds of coding. During the first round, more broad themes emerged from the comments, which were later collapsed into sub-nodes that surfaced more detailed themes. For example, for a question addressing ICT use in the project, data were first separated into negative and positive consequences, and while later rounds of coding generated themes such as budgetary constraints, capacity, organizational changes, stakeholder dynamics, as well as technological limitations and advantages. This process was repeated for all three questions.

Several scale variables were created in order to measure specific constructs. Generally, these variables were linear combinations of selected sets of items and they were tested for internal consistency using Cronbach's alpha. For bi-variate analyses, Oneway Analysis of Variance and T-tests were used to determine if mean differences in selected dependent variables were statistically significant. In the case of multivariate analyses Stepwise Multiple Regression was the principal mode of analysis to assess the extent to which variation in selected effect (criterion) variables is explained by sets of causal (predictor) variables.

The results from the survey (Chapter 5) are presented in the order of survey questions, with connections drawn to findings that surfaced during the interview stage (Chapter 4).

Sequential exploratory designs generally prioritize qualitative data (Creswell et al., 2003). In this project, drawing connection across the two studies was an important aspect of interpretation of Study 2 findings. As I noted earlier, this was done to further understand where the perspectives articulated by interview participants reflect those of the community of evaluation practitioners. Although both studies were carried out with samples that were statistically independent, engaging the survey results in this manner was intended to enrich the findings. The discussion of Study 2 findings are also followed by summarizing how the findings contribute to answering the research questions.

Interpretation of findings.

The findings of both were studies were jointly interpreted and will be presented in Chapter 6. This section focuses on answering the overarching research questions by drawing upon the data and analyses from both studies while also highlighting any differences that emerged. The findings that yielded from this interpretation were encapsulated in the final version of the conceptual framework which will also be presented and discussed in Chapter 6.

Chapter 4: Study 1 – Qualitative Findings

The following chapter presents the analysis of the data collected during the Study 1 period during which I interviewed 16 evaluation practitioners whom I have identified to be subject matter experts. These interview findings are organized according to major themes, commencing with an overview of participants' views on evaluation use. This encapsulates what in their view constitutes as evidence of 'evaluation use' or a 'useful evaluation', their perceptions of evaluator and stakeholder roles, and exploration of strategies used to achieve use. I then present findings pertaining to participants' views on ICT, including the influence thereof on promotive interaction within the team, and by extension, on evaluation use. Throughout the chapter, I use the findings to develop conceptual understanding of these issues to further amend the conceptual framework (Research Question 4). Lastly, this chapter closes with a summary discussion where I connect the findings to the major research questions.

Defining What Is or Is Not 'Useful'.

As noted above, in order to learn how participants use ICT to encourage evaluation use (Research Question 2), I first chose to explore what constitutes use, or what one might look for to gauge if use has indeed happened. This section outlines the summary of these findings.

Responses from participants indicated that use can take many forms (see Table 4), which is congruent with the literature as described in Chapter 2. The types of use mentioned in the interviews can be categorized as: conceptual use, instrumental use, process use, and what I would call relationship use (to be discussed below). Curiously, participants did not make explicit mention of symbolic use or frame this type of use in their comments. While this does not imply

that symbolic use is not seen as a legitimate form of use, it does suggest that the participants of this study may not recognize it to be as important as other forms of use.

Recall that instrumental and conceptual use pertain to the use of findings arising from an evaluation, even if this happens prior to the completion of the evaluation. Process use, on the other hand, speaks to learning effects arising from stakeholder proximity to the evaluation process (close observer, participant/co-producer of evaluation knowledge).

Table 4
Evaluation Use as Defined by the Participants
(Solid fill = some mention, Blank = no mention)

Participant	Instrumental	Conceptual	Process	Relationship	User-Defined or Evaluation-Specific
A	■	■			
B		■			
C	■				
D	■	■	■		
E	■	■	■		
F	■	■			
G					■
H	■	■		■	
I	■	■			■
J	■	■			
K	■	■		■	
L	■	■	■	■	■
M	■				
N	■	■	■	■	■
O	■	■			
P	■				

Only three participants described their idea of use as being purely instrumental. Instrumental use suggests that a tangible change in the program had occurred as a result of discrete decisions arising from the evaluation. This means that a program was changed in a concrete way, such as through expansion, scaling back, or even cancellation. For one of the

participants I interviewed, evaluation practice is built around the objective to directly affect the program, as seen below,

> I prefer instrumental, just because it's very direct, and stuff happens afterwards. I haven't really explored or focused more on the conceptual, or even symbolic type of use. My goal is instrumental use. That's been my goal consistently (Participant C).

Without making an explicit reference to instrumental use, this statement was echoed by another participant, who stated,

> I know that based on some of the data, or the meeting notes that they provide us, that they've looked at reports from last year that I wrote, and have used that to make changes to their programming (Participant M).

Conceptual use refers to the way in which evaluation can enrich understanding about the program, even if no concrete action takes place. Most participants acknowledged that use is most obvious when a concrete action took place, however, in the absence of such, sparking a conversation and offering something new to think about were most commonly mentioned as identifiable forms of use. For example, one participant stated,

> Even if they looked at it, and say, 'That's not the right way for us to go', that's okay. That's use. I mean, it's not that they accepted the recommendation, it's that they considered the recommendation and waited, because they may have other sources of information that they can bring to bear that you don't have, that they need to make that decision. That's fine. But the worst thing is, they didn't even seriously sit down and consider the recommendation. So long as they're actually... yeah, they're moving forward in some way based on the information. It's like, 'I got this information, okay. Yes or no, are we doing this?' or 'To what degree are we doing this or this?' Otherwise, I just think we failed. I mean, that's what evaluation is, it's helping to make decisions (Participant J).

Another participant expressed a similar perception, stating that,

> So, any time I'm getting the right people... the people who can make the decisions about the program, who hold the purse strings, who have hiring and firing privileges... whenever I can get them thinking and talking about what I have found, I think it's getting used. Once you open that door, it's hard to close it, so, even if I... if my contract is over and I haven't followed up to see... to see if they've implemented every recommendation, as long as I know that they are processing it, I'm feeling pretty good (Participant A).

This is a perspective on use that is not often touched upon, as it suggests that an absence of a concrete decision is a decision in and of itself, and that evaluation can still be called useful even if the client, having reviewed the findings, chooses to do nothing.

The majority of the interviewees expressed that evaluation use can manifest itself in both instrumental and conceptual ways. Some of the participants also saw conceptual use as being a stepping stone to instrumental use, suggesting that their idea of use was 'somewhere in between'. For example, one participant (I) stated that instrumental use can take time, therefore raising awareness was an acceptable form of use, as it paves the way to possible decision making down the road. Doing 'nothing' may thus be an acceptable form of use for evaluator practitioners, as it may also be seen as a temporary circumstance.

Surprisingly, only three participants made references to learning associated with the evaluation process as an indicator of use (i.e., process use). Process use supposes that participants stand to learn by virtue of being associated with or directly involved in the evaluation process. In the statement below, one participant stressed that process use and capacity building were consciously built into their evaluation practice,

> Every project we're thinking about not just how to get the client what they need, but how to imbue them with a little bit, you know, the degree possible, the skills that they will use to be able to do some of this project on their own eventually (Participant N).

Despite process use infrequently being isolated as a type of use, participants made specific mention about strategies to improve use, including stakeholder involvement. This means that users might be more closely involved throughout stages of evaluation, including data collection, analysis, and sense making. It is possible that while process use were not explicitly mentioned, this kind of use may nonetheless important to evaluation practitioners because it informs how they themselves structure and facilitate their evaluation projects.

Another theme that emerged in these conversations was the notion of what I labeled as 'relationship use', meaning use that is neither conceptual nor instrumental, but one that cements a new relationship between the evaluator and stakeholder. For example, when asked how they might know that 'use' has happened, one participant stated, that “Relationships don't end when contracts do” (Participant L). Three other participants made similar statements, stating that repeat business and ongoing conversations past the project's end were indicators that their work was useful to the client. This is evident in the statements made below,

> That's the easiest, certainly, test for a company to figure out whether or not somebody likes and is using your product, is if they continue to work with you (Participant N).

Fostering meaningful relationships was identified as a principle of collaborative evaluation (Shulha, Whitmore, Cousins, Gilbert, & Al Hudib, 2015) and relationship building was even shown to be part and parcel of how evaluation practitioners conceptualize success in collaborative approaches to evaluation (Whitmore, Al Hudib, Cousins, Gilbert, & Shulha, 2017). Drawing on data from evaluators, the authors argued that successful collaborative evaluation projects very much rely on the quality of relationships between evaluators and stakeholders, and that these relationships are mediated by a number of factors: trust, transparency, cultural competency, and structured and sustained interactivity (Shulha et al., 2015). While these important findings underscore the meaningfulness of relationships in the process of evaluation, meaningful relationship as an actual outcome of evaluation has not been isolated as a distinctive form of use. This may warrant further inquiry, especially given the continued interest in participatory and, as of late, developmental evaluation approaches. As these evaluation approaches tend to lend themselves nicely to long-term engagements, an indicator of relationship use could be a useful way to gauge usefulness at interim points of the project or process.

Lastly, several participants noted the importance of identifying project-specific indicators of use. This means that evaluation stakeholders would be the ones determining what is or is not useful, and as a result what is useful would vary from project to project. As noted by one participant, “That's not up to me, that's up to them. I can provide some bumper wings on it, but at the end of the day, they have to be the ones defining it” (Participant N). This sheds light on what is often absent from evaluation use literature, given that the standards for use have been largely evaluator-defined.

It must be mentioned that although most participants expressed what use might mean to them, several of the participants stated that, in practice, it is often difficult to know the extent to which use was achieved or when. Knowing about use requires extensive follow-up, which may or may not be possible in practice due to new contractual obligations, and other contextual factors, as will be discussed below. For example, one participant stated,

> When we talk about evaluation use, a big part of it for me is getting it out in the world for people to assimilate and use instrumentally, conceptually, in any way they want. And in that sense, there is really no way to know what's going on out there in the world (Participant H).

This further underlines the importance of ‘softer’ forms of use, such as conceptual or relationship as interim 'wins' for the evaluator.

These findings suggest that evaluators may be perceiving use in a complex way, as its meaning appears to be multidimensional and context-specific. It also reveals that the ‘stakeholder dimension’ is important to evaluators, as some of them recognized the importance of stakeholder-defined indicators of use, and of relationships that help to cement use.

Who and What Influences Different Forms of Evaluation Use?

To explore the concept of use further, I asked participants to discuss what is required of the evaluator and the client for evaluation use to occur. This was done to further validate the conceptual framework, which, drawing on existing literature, poses that use relies on context, relationships, and each party's willingness to engage with the process. To summarize briefly, the findings drawn from the analysis corroborated this conceptual framework, and underscored the interdependence between these individual components (see Figure 6).

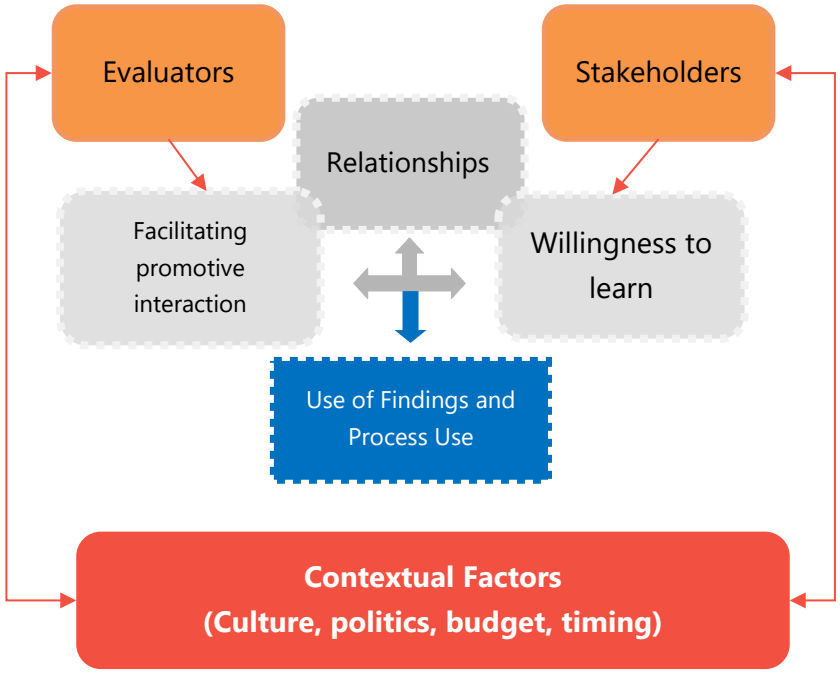

Figure 6: Updated conceptual framework
Interplay between factors that influence evaluation use

The participants noted that stakeholders must be willing to learn, while the evaluators are required to build the necessary conditions to promote that learning. Aided by intercommunication, the quality of relationships between these two groups helps to mediate

these roles. However, some differences also came to light, chiefly in the discussion about context. According to the participants, contextual factors underpin, and in many ways, prescribe the scope to which learning can unfold. Context can detract from stakeholders' willingness to learn or add to it, just as it can limit the evaluators' reach and facilitation efforts. I will discuss these findings in greater detail next.

Evaluator's role in use.

Most of the participants that I interviewed expressed that it is the evaluator's role to *facilitate* evaluation use. Demarcating facilitation as a responsibility seemed to match evaluators' overall perception of what is useful. Most participants valued stakeholders' learning about their own program, and in some cases, saw this kind of learning as a stepping stone for further decision making. In other words, rather than being responsible for *actual* changes decision making, participants spoke about helping to pave the way towards it. Facilitation thus implies a proactive stance, and one participant (O) underscored this by stating, "The evaluator must question, plan for, and drive use throughout the process. If they leave it to fate - it may or may not get used". As discussed next, evaluator responsibilities were expressed through a number of interconnected evaluator skills and competencies seen as essential to facilitation.

The importance of meeting user needs was prominently mentioned by participants, suggesting that 'use' is perceived in part as the convergence of evaluation meeting an existing demand. For example, a quotation from a participant (G) framed this both as being a product ("something that is usable"), and a process ("meets needs"). Related to the earlier section where I noted that some evaluators see use as a chiefly stakeholder-defined concept, this finding suggests that evaluators must first surface what kind of learning stakeholders are looking to

obtain from evaluation. From there, evaluators would structure their facilitation efforts accordingly. For example, this might entail inquiring what information matters to stakeholders, or what they are looking to find out. Do they prefer evaluation reports or visualizations? Should findings be communicated at the end of the project or intermittently? Naturally, the cornerstone of surfacing user needs is communication, and participants in this sample underscored its importance. For example, one participant stated that the evaluator's responsibility resides in "…working with the key leader or leaders stakeholder group at the outset of the project to really be sure about what they key questions are, the key wishes are that need to be addressed" (Participant P). Being cognizant of the contextual factors that influence users' needs, or their perceptions thereof was also noted. For example, two participants stated,

> The evaluator really needs to be purposeful about how they navigate both the political environment, understand the decision-making processes, timelines, if they really want use to happen. I place a lot of burden on [the evaluators] (Participant C).

> ... The real issue is, are you giving people information that they can use for dealing with the pressures that they're living in? They have their budgets to defend, they have their politics that they're living in, they have, you know, competing claims on their time and their resources (Participant H).

While a small number of participants mentioned the importance of methodological competence, the majority emphasized evaluator's soft skills and the ability to help stakeholders interpret data. This requires evaluators playing a brokering role in turning raw evaluation data into information that can be consumed and/or acted upon. For example, two participants noted,

> Good evaluators need a certain amount of courage and conversation skill, communication skills... and that's different than... very, very different than knowing what statistical tests to run. That is our sole purpose as an evaluator - to help people make decisions based on the data they collected. We have to play that interpretive role (Participant A).

> ... Finding ways to frame evaluation findings, that's where you get down to it, is really... understanding how to frame evaluation findings in ways that... that will appeal to those decision-makers'... existing lines of thinking (Participant B).

These quotations suggest participants seem to value user-focused, tailored approaches to conducting evaluation, and play intermediary roles not only between data and their potential consumers, but also among contextual forces. Participants' statements about evaluator's role suggests that facilitation be more of an art rather than an exact science, and requires flexibility and communication to enable learning.

Stakeholder's role in use.

While the evaluator can enable the learning environment, stakeholder participation remains largely voluntary. Most participants thus emphasized that stakeholders must, at least to some degree, exhibit a genuine desire to learn from evaluation. This stance is evident in the following accounts made by participants,

> I think on the stakeholder end, it's... Number one, wanting to use it (Participant A).
>
> ... Willing to get involved with evaluation and are not afraid of evaluation (Participant E).
>
> Quality of the evaluation happens from people's interest and their commitment (Participant H).
>
> First of all, they have to have an openness to learning, which sounds like it should be basic, but isn't always. So, that's fundamental (Participant M).
>
> They also have to be open to both positive and negative findings (Participant O).
>
> I think just that strong willingness to engage and collaborate through all the phases, from the first meeting around the project and having themselves and/or their small team engage around the planning and what the project plan and the tools are going to look like; giving feedback on the tools; and then all the way when they see the draft report and providing feedback, sitting down and looking at that, and you know, getting their hands dirty, through all phases of the evaluations (Participant P).

Without an inherent foundation of interest demonstrated by the stakeholder, learning of any kind cannot occur. These quotations reinforce the conceptual framework in that evaluative learning is reliant on joint effort from both parties, a process that one participant (K) described as being

‘back and forth’. This dynamic was also evident in the following quotation from another participant,

> [Stakeholders] need to be involved right from the beginning. They need to... the purpose of the evaluation needs to be aligned with their purpose for having it done. The evaluation questions need to represent their genuine curiosity, they need to answer the questions that they have. They need to, as much as possible, co-create the logic model and the evaluation plan. They need to be involved in the data analysis as much as possible. And the reporting needs to take into account their preferences and time limitations, etc. so that the reporting needs to be tailored to those particular stakeholder groups (Participant D).

This quotation describes the interplay between the evaluator and stakeholder roles, whereby the evaluator responds but also stimulates demand. This quotation also infers the importance of good working relationships as a meshing mechanism behind use, and especially in what I coined earlier as relationship use.

Other stakeholder responsibilities included the need to encourage and promote evaluation to 'the right people' within the organization. One participant explained, “Leadership has to be committed to pulling those people together to consider that evaluation information that you've presented to them” (Participant J). This was echoed by another participant who said,

> And on [the] stakeholder’s plate is also making sure that evaluation is getting to the right people, that all the folks who need to hear about it and make the decisions are getting the report, or are going to be in the meeting (Participant A).

This suggests that for some participants, the push for instrumental and conceptual use should come from within client organizations, or at the very least, with their active support. Speaking about instrumental use, another participant stated, “You can do lots of things, but at the end of the day, use ... it's almost outside of your ability. It resides with the clients and the stakeholders (Participant L). Another participant noted,

> ... There are lot of good reasons to do things, unrelated to the technocratic question of whether a particular program is working in a particular way or not. And to say that, well, 'People should simply take the advice of technocrats like us when we do an evaluation', I think would be a recipe for disaster in this universe. I think it's a good thing... I mean, I want politicians and civil servants

> making decisions, I don't want technocrats like us, looking at data and making decisions (Participant H).

This once again suggests that although the participants embrace responsibility over the process, that is to say, its *usefulness;* actual *use* resides within stakeholder realm of control, or depends on other contextual variables, as discussed below.

Contextual factors.

In addition to stakeholder and evaluator roles, participants were asked to speak about the function of context. As a concept, 'context' recurs in evaluation literature where it is regarded as imperative dimension of evaluation practice, and simultaneously both a barrier and a facilitator to evaluation use. Contextual factors concern not only who is involved in the evaluation, but also other intersecting aspects like goals, language and culture, politics (Vo & Christie, 2015). Contextual factors may thus set the stage for evaluation and dictate what may or may not be possible to achieve, hence why this element was incorporated into the conceptual framework, alongside stakeholder and evaluator roles.

Most participants spoke about organizational culture as a significant contextual factor, particularly organizational cultures that are hierarchies. In such a culture, evaluation is often mandated, and can thus be treated as a 'checkbox' or chore. As I already discussed in Chapter 2, such evaluations are predominantly used to serve an accountability function. This tends to diminish the stakeholders' willingness to learn or use the findings. The following quotations from participants highlight this experience,

> Sometimes evaluation is mandated, and people don't have any plans to actually use it, they just need to have it to check a box. I've been in that position. So, they need to want to use it. They need to be open to it (Participant A).

> From the stakeholder's point of view, it's to treat the evaluation seriously, and know that the reason for the evaluation is to make their program better and prove that it works, not to check a box (Participant G).
>
> It's important that the clients that you're doing an evaluation for, that they're actually interested in the learnings that would be generated from the evaluation, whereas if you're working with an organization just going through the motions of evaluation to check it off their list, they may not want to get engaged in the evaluation process and there's probably a lower likelihood of them using the findings (Participant K).
>
> We like to work with committed people, we don't want to work people that are sort of just, 'I need this report to just lay it on someone's desk', which happens quite a bit, and it still happens. Whatever, you've got to deal with that, but in theory, we'd like them to be fairly committed and interested, and dedicating some of their own time and attention to the project (Participant N).
>
> If the evaluation is a bureaucratic hurdle – they often are not [open to use]. If they are open to use – there is great possibility (Participant O).

Interestingly, at the time of these interviews, four of these participants functioned as external evaluators with a strong emphasis on facilitation and capacity building. It is possible that the perspectives expressed here may be characterized by this philosophy. In other words, if working closely with stakeholders is an integral part of the evaluator's practice, this may in turn shape their expectations of stakeholder commitment. Hierarchical and clan organizational structures (Kargas & Varoutas, 2015) can also be problematic, especially for external evaluators, as they often comprise of tacit practices that the evaluator may not be aware of. One participant noted this as an obstacle, stating, "You can't go in a [non-for-profit organization] there as a consultant, and just start telling people what to do, and how things are going to be evaluated (Participant D)". This remark is reminder that an evaluator is often an outsider, and must often become a mediator long before they can conduct the evaluation they were hired to do.

Linked to organizational culture were the factors of timing and budget. In theory, conducting an evaluation makes the most sense when its findings can inform how to improve the program. Nonetheless, in contexts where budgeting does not align with the timing of evaluation, decision-making is made independently of evaluation evidence. This can also occur in situations

where existing political standings have influenced decisions long before evaluation was commissioned (Patton, 2008). Three of the participants noted this contextual factor as an obstacle to evaluation use. One participant said,

> It has to fall in at the right time, like when they're actually making decisions... why do we have reports due after a year when the decisions are going to be made in 6 months? So, timing is an issue" (Participant A).

This speaks to an evaluation in which timing did not align with decision making. Another participant spoke to the political character of evaluations by stating, "So many decisions about funding are very political, and are not really based on evidence, but political standings" (Participant B). Lastly, another participant (K) noted that timing is an issue when it aligns with other unforeseen organizational changes. The participant stated,

> ... If an organization is changing or growing, and their evaluation needs or focus changes from the start of the evaluation to the end of the evaluation, and that's very disheartening as an evaluator... And I think that... I mean, in some instances, it's not preventable (Participant K).

The comments from participants underline that evaluation use is often at the mercy of context, given that the evaluation itself is an exercise that unfolds within a political context. One other participant (L), described this by stating,

> The context will emerge depending on how sensitive the evaluator is to the various nuances of what's going on in the context: politics, and resource management, you know, those are always part of evaluation (Participant L).

While some situations allow for maneuverability, participants' views suggest that context very much prescribes the extent to which use will emerge.

To briefly summarize the sections above, most of participants in this sample valued the kind of use and learning that informed stakeholders about their program, and aided them in concrete decision making. Ignoring contextual factors, participants saw themselves in the role of facilitators who simplify the evaluation process, respond to needs, and help with the interpretation of findings. The findings also revealed that evaluators tend harbour responsibility

for making the process ‘useful’, even if they shy away from being responsible for ‘use’. Having developed our understanding about respondent’s perceptions about evaluation use, we now turn to issue of central interest to the research, the role of ICT in bringing about evaluation use.

Connecting ICT to Evaluation Use.

To understand the role of ICT in use, I first asked participants to speak about what role ICT serves in their practice. The aim of this question was to illicit participants’ views on the value of these tools prior to delving deeper to unpack their ICT strategies or surface lessons learned. Rather than focusing on ‘what’ ICTs are used, I aimed to explore ‘why’ evaluators may be reaching for these tools. As noted by Azzam and Robinson (2013), technologies are continually changing, therefore focusing on the ‘why’ may have more long-lasting relevance to evaluators. The importance of refocusing our attention to ‘why’ was also noted by Love (2004), who noted that,

> Harnessing the power of ICT for evaluation depends largely on appreciating the pros and cons of these tools and using this knowledge to shape technology to our own ends. The inherent flexibility of electronic tools should encourage us not to fixate on the hardware and software but to direct our attention to improving the evaluation process: making it more inclusive and transparent, building truly collaborative evaluation efforts, removing the drudgery from data collection and focusing more on data analysis and use, and vastly increasing the reach and impact of evaluative information for the betterment of all (p. 3).

If we assume that practitioners are interested in the ultimate goal of evaluation use, exploring how ICTs factor into that goal helps us understand its contributory value.

ICT Improving Background Processes.

The findings reveal that ICT’s potential to improve use is tied most closely to aiding ‘background’ processes and improving the technical aspects of evaluation. The majority of the participants noted that ICT simplifies their practice, citing improved speed, convenience, and

efficiency. This was linked mostly to ongoing developments in data collection methods, and to a lesser extent, data analysis. For data collection, this includes data collected remotely with the use of mobile technology, social media, satellite data, or 'Quantified Self' and 'lifeblogging.' Such tools have the potential to widen evaluation's lines of inquiry, and potentially be able to answer evaluation questions with more confidence. As one participant noted,

> The extent to which you can have new choices for collecting data is gigantic because when you think about choices for collecting data, that changes the evaluation questions, it changes the research design, it changes... it has implications for everything (Participant H).

A number of participants spoke to the value that ICT brings to their evaluation practice, noting benefits such as ease, efficiency, convenience, and speed, among others. As seen in the quotations below, ICT is seen to benefit evaluation practice by working on the sidelines to simplifying ongoing tasks and processes. The following quotations are from two practitioners, each of whom conducts evaluation in a different setting: one is an external evaluator at a large health-focused organization, whereas the other is employed as an internal evaluator in an academic institution.

> [It is a] potential mechanism to make my life easier, and hopefully, if used correctly, to maybe have more confidence in the information... (Participant J).

> [It means] ease of use, efficiency, flexibility... You know, reducing the intensity of labour and resource allocation dedicated to certain aspects of projects (Participant P).

Two other participants made similar remarks, noting the importance of ICT in reducing speed of evaluation activities, and tied this to decision-making. Both of these participants are usually in the function of an external evaluator and both have strong insights into international development contexts.

> I just think that the whole process would have been... more difficult, would have been longer... so, I think that technology lets us move faster than we've been able to move before, get people the information they need to make decisions faster than we've ever had before (Participant A).

> ... If you're able to get data a little sooner than you normally would, then the idea is that you can feed that data analysis... if you're doing it properly, you can feed some of that data analysis back to adapt the program as it's running rather than waiting until, you know... the end line evaluation, to make changes to how the program is running (B).

Although most of the participants noted the importance of ICT for data analysis, only one of the participants made explicit mention of big data and artificial intelligence, noting the tremendous potential these tools can bring to analysis of data, especially in evaluation focused on international development or large-scale government initiatives. The participant spoke about this benefit in regards to a past project, stating,

> You have... the possibility to look into 140,000... you know, letters, documents, cries for help, etc, which were real time, you know, stored and which can now be analyzed. And we found absolutely astonishing things (Participant F).

The participant noted that the analysis using big data resulted in a high impact on the stakeholder, aiding in conceptual use that would have otherwise not have emerged.

The findings suggest that ICT has the potential to enable evaluation use in a number of different contexts, however it does so largely behind the scenes by simplifying and streamlining evaluation work. While this most directly affects the evaluator himself or herself, the tools also have the potential to produce better evaluation findings, such as by improving data quality or allowing results to be produced much faster than before. In this regard, ICT has the potential to aid the evaluator in meeting stakeholder needs by offering higher quality data, and doing so rapidly and more efficiently. The tools thus play a role in reducing the burden on the evaluator in order for facilitation - a process most regarded as being interpersonal - can then take place. This point is addressed further below.

ICT improving foreground processes.

In addition to improving background processes, participants also spoke to the ways in which ICT affects communication with stakeholders. Analyses suggest that this may be

occurring in two ways, by opening new channels of communication, and by adding value to existing meaning-making processes, discussed next.

Supporting communication with stakeholders.

The first way in which ICT affects communication is by opening new channels by which evaluators can reach their audiences. One participant connected this to evaluation use, noting the value that ICT can add to the process. This participant (G), who typically functions as an external evaluator in projects focused on creative outreach, stated,

> I think the drive is engagement with the stakeholders, with clients. And the drive is impact, and if you think seriously about impact, and if you think seriously about connection, and you look at the logic models that ... the standard approach for a logic model ... the process, the reporting styles, and themes that have been popular in evaluation for years - they're not reaching the stakeholders that should be engaged in the process.... And in a world where everybody is walking around with a cell phone, in world where people have social media accounts and other things, in order to effectively reach our stakeholders, engage with them, we have to learn how to use these platforms to engage with people, and that could mean sometimes developing infographics, or videos, or courses or rolling out in different ways, if that's how we can reach the people (Participant G).

This can also mean connecting remotely based individuals that would not otherwise connect for the purpose of evaluation. In that sense, ICT facilitates the process of bringing actors together who otherwise would not be able to collaborate. For example, one participant, who works predominantly in educational evaluation, suggested that ICT offers stakeholders avenues for providing input. The participant noted despite these tools being commonplace, their use widens the spectrum of stakeholder involvement, which this participant embraced in their practice, as noted in the quotation below,

> I involve the different people whether they are program participants, or key stakeholders, or funders, I think there is a role for them to play in the work that we're doing, and the role will vary depending on the person, and the level of their involvement, but there is certainly a role for them to play. And technology can help with that, because even if people can't physically be there, we can bring them in for portions by Skype or by Adobe, you know, we can take images, we can make videos, we can record our sessions, so that people can still be part of the process even if they're physically absent from that process. So, that becomes important. Technology is just part of the way that we conduct ourselves as evaluators, and it means an ease to facilitating

> communication, and being able to communicate with our clients, and participants, and with organizations, it's so central to what we're trying to do, which is help evaluations usefully contribute to things. We couldn't do it without technology, at this stage (Participant L).

Another participant (P) echoed this sentiment, noting the way in which the evaluation process can be simplified by capitalizing on ICTs used for collaboration. The participant stated, “It gives us certainly lots of flexibility about who we can reach, and when we can reach them”, and explained this in relation to the context,

> Whether we're doing focus groups or interviewing, it is just a way nicer level of data gathering than using a telephone, or e-mail, or some other way of trying to retrieve information from stakeholders who may be... those interviews and focus groups, you're looking at typically people who are very busy, or difficult to reach or difficult to get to together, or in different geographical locations, and if you can get them all in video teleconferencing in one situation, it's just really nice to get that dynamic and the physical presence, the body language and everything, of seeing people (Participant P).

ICTs used for group collaboration can also help sustain communication in multiple-year evaluation projects such as those that rely on input from geographically dispersed stakeholders, as was noted by two other participants (C and H), who were both engaged in such projects. Nevertheless, one of these participants (H) shared his view that while collaborative software can improve ‘tightness’ of communication, that is, by opening new channels or shortening distances, it does not always deliver the promise of the ‘richness’ of such, as expressed in this quotation,

> Anybody... who thinks technology is the solution, is going to be guaranteed to not have a solution because that's not the problem. The problem has to do with, why is it that we don't want to collaborate or interact with each other? How frequently can we collaborate? Do we understand each other? Do we have cultures that are different? Do we have different missions that we need to worry about, or different politics? Different skillsets? People sort of jump to technology as a solution to a problem, when the problem is really psychological, and cultural, and organizational, and economic. Different dynamics are involved. Technology is not going to change any of that (Participant H).

This suggests that merely ‘connecting’ individuals may not be enough. In that sense, ICT tools used for collaboration have little bearing on promotive interaction within the evaluation process, just as opening the door does not entail that something of value may be found inside. What

actually drives promotive interaction is emphasis on interpersonal processes, and their presence is what brings technology in evaluation to life.

Adding Value to Existing Meaning-making Processes.

In addition to its function as a connector, certain ICTs have the potential to enrich the evaluation process by facilitating communication. This is related most closely to ongoing developments in data visualization which are starting to transform how evaluation findings are produced and communicated. The view expressed by participants is that data visualization and visual storytelling are ICT tools that make findings digestible and meaningful to users. In that sense, by making findings utilizable, ICTs in the form of data visualization tools benefits conceptual use the most, and potentially, also instrumental use. For example, the following quotations from participants expressed the way in which this occurs,

> [The stakeholders] tend to be... at least, experientially speaking... more responsive to the results. They ask better questions, not necessarily more, but better questions, for clarity. They seem a little bit less overwhelmed by the details that we do offer (Participant C).

> And when we communicate the information in a visual way, people are more engaged with it because they actually understand it, and they're more likely to use the information to make decisions (Participant K).

Despite the value that ICT lends to communication of findings, the key theme to emerge from these conversations is that the evaluator is the catalyst in bringing technology to life. The view that technology and its' associated 'bells and whistles' can replace other skills which are core to the evaluation profession, was noted by the participants as being a misconception. For example, speaking about data visualization, one participant noted shortcoming of certain software to relay messages efficiently, and noted how important it is for evaluators to rely on their interpretive skills to help stakeholders make sense of data. The participant stated,

> Interpreting data and telling a story is a subjective process. It requires a human. And we've been sold on this idea that technology can do it for us, you just have to push a button (Participant A).

This notion that ICT can only go so far is congruent with the literature. For example, a report by Simister, James, and Scholz (2017) reflected on the value of the human intermediary, and noted the following,

> Whilst many innovative methodologies generate a large amount of *information*, and some (e.g. data visualisation) can support enhanced *knowledge*, it is important to recognise that the ultimate aim is to enhance *wisdom*. It is therefore important to recognise and support the human capacities needed to translate information into knowledge and wisdom. ICT innovations can only take an organisation so far (p. 3, emphasis in original).

Another finding to emerge from the interviews is the notion of juxtaposing ICT with interpersonal dynamics present in the context, which sometimes means deliberately stepping back from or balancing technology to allow learning dynamics to emerge. This was elaborated by a participant who, despite their enthusiasm for ICT, made the following remark,

> Sometimes I find that having the devices out, whether it's laptops or tablets, actually limits the collaborative interplay and the dialogue, which is what I need in order to get their understanding of the data, so that I can go back to... move to the next stage, which might be a deeper analysis, or it might be a report. But people... whether it's a self-regulation thing, people aren't able to stay in the moment and they're hitting their Home button, and going to other places, they're not staying on the data displays that we've put together, or... the screens are up, so people are focused on taking notes rather than actually having a conversation and probing one another's ideas. I'm not really sure why, but I find that the level of engagement, when we use the devices for data display, is not as high. It doesn't feel the same... the level of commitment, level of dialogue, level of contribution, as it does, when we take the devices out of the equation (Participant L).

This example suggests that in projects that call for facilitation of joint meaning-making, inundating stakeholders with technology can have a negative effect. However, this participant also spoke to the value of data visualization ICT tools in relaying finalized findings to stakeholders in management positions. The difference between the two scenarios is that, in the eyes of the participant, consumption of static findings relies on dialogue less so than the stage of data interpretation. These findings are in line with the themes already discussed, and suggest that evaluators see communication as the backbone behind use, and embed ICT at different stages of

evaluation in a way that would not detract from this effort. Another way to think about this is that evaluators take a needs-based approach to ICT, as described by this quotation below,

> What does our client want from us, in terms of how we... if it's technology and interaction with technology, that's the... I mean, technology has got a lot of pieces, but if it's there for interaction, communication, getting buy-in, that way... is that what they want? What do they want? Not what's convenient for us (Participant J).

Taking a needs-based approach to ICT implementation can also mean foregoing the use of these tools completely. For example, many of the participants also spoke to the importance of simple communication for early planning stages of evaluation, resulting in a largely technology-free strategy. For example, three participants stated, the following,

> I'm sure the tools are there, but I feel like a lot of the planning stage stuff is discussion... and thinking, and conversation (Participant A).

> We just have a conversation: understand their needs, and then try to figure out how we could meet those needs, and then after the meeting we figure out potential options and we discuss it. We see what their experience with technology has been in the past, you know, whether they're open to it, and then make a determination based on that (Participant C).

> ... Even when something needs a technical solution, we don't start with a technical solution. Usually, we start it with paper and conversation, and about what people are trying to accomplish, how they're trying to accomplish it, and then try to reduce the stress level in terms of the use of the technology, and take the thoughts away from the tech itself, and on to the underlying kind of goals, and choices that need to be made (Participant G).

It is worthwhile to note that these quotations come from participants who functioned as external evaluators at the time of these interviews. External evaluators are often burdened to build new relationships and learn contextual ins and outs, while internal evaluators typically have the benefit of established relationships and closer understanding of organizational structure and culture (Conley-Tyler, 2005). Participants' own function within the organization may thus explain why the strong focus on interpersonal communication at this early stage emerged in these conversations.

To reiterate, having a needs-based and user-centred philosophy very much defines the participants' outlook on evaluation practice, and similarly, informs their views about ICT use. Keeping context-dependence in mind to reduce burden on the clients was also a prevalent theme. In such cases, participants spoke about taking steps to slowly sensitize and incentivize clients to the future use of ICT. For example, one participant summarized this in stating,

> You have to be really careful with interactive [ICT tools], because... if you're not extremely purposeful about, at least the initial five minutes in which they're interacting with something and guide them through that clearly, then it's easy to get lost and confused. It provides too many options (Participant C).

The overall stance emerging from the analysis of the data is that ICT can play a supportive role in aiding promotive interaction, but only when the tools work in tandem with other crucial processes (see Figure 7 for an updated version of the conceptual framework). For example, emphasis on communication and responding to stakeholder needs were common elements voiced throughout the interviews. The data also suggest that facilitation of promotive interaction differs from project to project, as one participant explained,

> There is a ton of different tools, and only... if you look at design, if you look at communication at the most basic level, it's never going to be about one or two tools or switching the tools anymore. It's about looking at the people you're trying to connect with, finding out what they're using, and then using those tools to try to reach them. So, there's a complete openness on my part to explore any and all technology that will allow me to connect with the people that I'm trying to connect with, or that... the client I'm working with is trying to connect with. So, I bounce around tech quite a lot too (Participant G).

One other participant (L) described navigating this process as, "... A winding path that contains hills, and twists, and turns". In other words, the use of ICT alone will likely have no bearing on the learning within evaluation process, unless it is used purposefully, 'humanly', within the right context, and with a certain degree of skill. This finding points to an ironic dynamic whereby the

successful use of technology can be attributed to skills and processes that are not always technology-dependant.

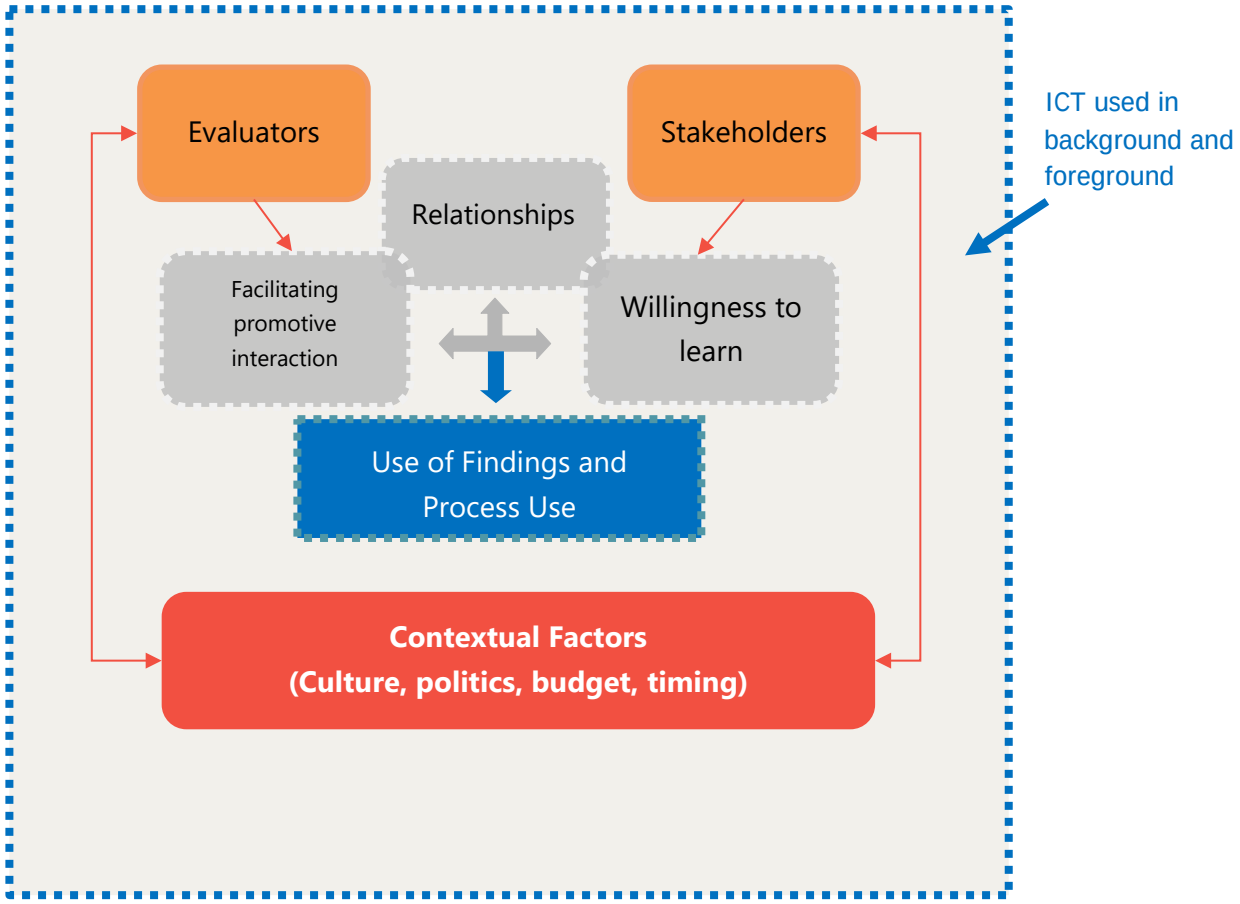

Figure 7: Updated conceptual framework
Interplay between factors that influence evaluation use and ICT

To reiterate, these interviews suggest that *individuals are the cornerstone of promotive interaction*, whereas the *evaluation products* stand to gain the most from ICTs. An example of this is how data visualization techniques facilitated by ICTs are helping to diversify findings, thus moving further away from what is often referred to as 'thick binder reports that end of on dusty shelves'. Yet, what must be underscored is that the *process* to get to the product is paved by building a strong relationship and fostering ownership of the evaluation process. For

example, a number of participants spoke to the importance of building ICT use around user needs and the needs of the evaluation. Thus, while an evaluator can use mobile data collection or rely on novel ways of disseminating findings, the process through which it happens should be user-informed.

Barriers to ICT Implementation and Use in Evaluation Practice.

Participants were asked to speak about various barriers to ICT use that they have encountered in their practice. A number of themes have surfaced throughout these conversations, which are presented below in the order of most commonly to least commonly mentioned barriers. These include context-related constraints such as organizational culture and lack of internal capacity for ICT use; evaluator skills and lack of technical know-how; technical limitations of ICT tools and perceived lack of fit for evaluation practice; budgetary constraints; and ethical considerations. Each of these themes will be discussed in detail below.

Organizational culture.

The most common category of barriers, as mentioned by ten of sixteen participants, were those related to context, such as client hesitations, which can sometimes stem from bureaucracy and culture ingrained in client organizations. A number of participants noted that unwillingness to engage with technology in its various aspects can naturally act as a strong impediment to the use of these tools. Referring specifically to the use of data visualization tools and new ways of dissemination, one participant noted that this can at times stand at odds with long-existing reporting standards, and thus invite client apprehension,

> I tried to convince people to do it, but nobody really wanted to go along, and I think what I realized is... Part of the reason there was resistance is because people didn't know what I was talking about, because there really isn't much out there (Participant M).

One participant (C) noted that there exists a real “anxiety about the use of technology”, and stated, “The client is not always interested in that kind of stuff, or may find it intimidating/confusing”. Another participant noted that it can be easy for clients to “overwhelmed by all the options by all the options of all the different pathways they can go” (Participant G). Similarly, two other participants explained that client reservations can shape evaluation, and this includes reservations about technology use as well,

> Infographics are usually designed by city folks, and so are our evaluation tools, and methods, and frameworks, and they don't have the same meaning in the country (Participant E).

> Is it convenient for us? Yeah. Is it convenient for them? I don't know. Does it turn them off? Are they upset with it, are they happy with it? You know, it's just as important, like you said, for utility, to understand that role of information technology. If they're not buying it or are into it, they're not going to use it. If there is any disbelief of any part of your process, and that includes the use of information technology in any way... (Participant J).

This suggests that even if program evaluators are eager to use a variety of tools in their practice, the realm of possibilities is affected by organizational culture and expectations, further influencing stakeholder’s willingness to engage with these tools.

Lack of internal capacity.

Similar to organizational culture, lack of internal capacity for ICT use was also mentioned by four of the participants, who noted it as an important constraint. One participant pointed out that despite the interest in mobile data collection, for some organizations, and particularly those of smaller size, the prospect remains cumbersome. The participant noted,

> It's such a massive undertaking, that it's also... it takes a lot of effort to also get the solution, and I think that's part of why it is so... it's not as sexy to think about, is because it's a massive human effort. You need a big team and a big institution to collect a lot of data, because it's still is mostly busywork (Participant N).

Some organizations may feel the need to include ICT tools in their evaluation projects because of their perceived added value or the potential to generate additional funding, even when they

don’t have the capacity to implement the tools or maintain its upkeep, as noted by one participant (B). Bringing a new tool to an organization that does not have the capacity to act on decisions offered by rich data provided by ICT tools can bring about the same roadblock. For example, the participant explained,

> Are organizations even equipped to make decisions quickly? They might have data just pouring in, but if they don't know how to sort through that data, and that data is not actually feeding into their decision-making process in a timely way, then you've got all this technology, but you don't have the decision-making capacity, or you have the same decision-making capacity you had before, so what's the point of speeding up one side of you can't speed the other side up? (Participant B)

This is an interesting perspective because it implies a conflict between satisfying stakeholder needs and yet working to establish a fit between demands and capacity. Another participant echoed this statement when speaking about the absence of capacity of ICT in some contexts, and the lack of training that leads technological systems to failure. The participant noted,

> I've seen where states have invested huge amounts of money in data collection systems, and just said, 'There it is!' People are like, 'I don't know what the hell to click, what to press, where to go', right, so it fails (Participant J).

This suggests that ICT can be a barrier if technology growth within an organization is not in equilibrium with capacity to both use these tools, nor reap its benefits. Given these pressures, one participant noted that clients may undergo an internal debate of whether ICT use is advantageous, stating that,

> With uptake of any technology, there are going to be people who grasp it and run with it from the get-go, and innovate with it and take it forward, those are the early adopters. And then, there are going to be most people who are slightly more questioning of whether this adds value to their process or not. And then, there are going to be those late adopters who just outright oppose it and do everything they can not to have to use it (Participant O).

In essence, ICT use is yet another layer of investment required of clients, and internal capacity can impede its use even if there is no outward hostility towards technology. In other cases, it seems that the attitude towards new tools is a combination of these factors, including fear of the

unknown or lack of time for technology implementation. For evaluators looking to employ these tools in their work, context can therefore be an ongoing barrier.

Evaluator skills.

A number of participants voiced that ICT use can sometimes require additional learning and the honing of skills not traditionally used in evaluation practice. A variety of barriers arise as a result. These include barriers that can be perceived as being internal to a practitioner's individual practice, such as lack of technical skills and competing demands. On the other hand, external barriers are manifested by peer pressure within the evaluation field and lack of established connections with ICT experts. I will briefly discuss these two categories below.

Regarding internal barriers, evaluators face a number of challenges. For example, two participants underscored the pressure to stay afloat of the rapidly changing landscape of ICT use, as noted by the quotations below,

> The amount of effort needed to put into learning tech, learning digital, learning how to reach people, the amount of education required and experience required to do that is increasing, because the demand is... the availability of these tools is increasing. There's a tech barrier, in terms of just tech savviness and people not having the time, or trying to start from scratch, rather than building on a body of work that they just don't know is out there (Participant G).

> It feels a little overwhelming when you're starting from behind, in terms of technological fluidity or technological fluency, and it is hard to ever feel like you're getting caught up, because it is changing faster than you can learn it (Participant L).

Lack of technical know-how can also impede on other time-sensitive tasks required by evaluation, such as relationship-building with clients or obligations such as technical report writing. In these cases, the learning curve that comes with any new technology can be seen as a barrier, given that gaining this additional knowledge would constitute an extra step in what can already be a complex and systematic exercise. One participant noted,

> I use technology on a need-to-know basis. I pick it up when I need it, but even then, it's a time investment... I may have the motivation. I may desperately want to do it, but the practicality is that... No, I just... I can't do it, unfortunately (Participant D).

Discussing their past experience, another participant noted,

> I didn't use technology enough because I didn't know how to, and I was so busy trying to learn how to evaluate and how to work in different contexts that I didn't also engage in learning how to leverage technology in those environments as much as I could have (Participant L).

This suggests that ICT-related skill development may be in competition with other skills that practitioners may be expected to hone along the way. In such situations, this kind of skill development, unless deemed essential, can naturally lose priority.

Regarding external barriers, practitioners may face pressure from their peers to juggle multiple roles or be seen as a 'jack of all trades', as was noted by one participant. This participant also explored the issue of demographics as a barrier for evaluators' skill development,

> Things are changing, just because the demographics of evaluators are changing. There's are a lot of new, young evaluators getting into the field who are extremely comfortable with social media and extremely comfortable with technology. And you know, if you start your career as an evaluator taking it for granted that you're going to have to design nice reports, then you learn how to do that, whereas if you're somebody like me, who for the bulk of my career just did standard kind of reports, then you're going to have to teach an old dog new tricks, right? And that's a little bit harder. So, I think the culture is changing, and I think... I wouldn't say... that our field does not adapt, but think there have been some innovations where we've been very slow. One was mobile data collection... (Participant D).

This quotation suggests some practitioners may feel that their technical proficiency is ironically being judged or 'evaluated' among their peers. For participants employed as independent consultants, such pressure can be an especially intimidating barrier. As a result, a number of participants noted that juggling multiple roles has led to serious deliberation or effort to build viable networks with established IT specialists, as discussed below,

> I think that evaluators can provide a really interesting mindset, understanding, and critical thinking processes that are necessary in order to conduct an evaluation, understanding of... you

> know, of selection methodologies and validation and that sort of thing, but they may need to collaborate with folks that understand the technology side, if it's not their forte (Participant B).

> I think there needs to be a lot of collaboration, individual collaboration. I think the other parts is there are people who are really good at this stuff, and that they're going to need to be expanding more on the web and pushing it out, the better stuff needs to get out there, and there are definitely collaboration opportunities. The trick, as usual, is to get people to co-ordinate, collaborate with one another and understand that there's some over overlap between different fields than people use give credit. It's not just that... and so many things are interdependent, not just overlapping or briefly touching on one another, and for anybody to succeed they have to understand what their limitations are, and seek help in terms of collaboration to help kind of shore up those limitations, so they can do a better job, rather than spending all their time trying to figure how to poorly design a website, to work with a web developer, you know, who knows what they're doing, or to work with a content strategist or a copyrighter. I think there are a lot of opportunities for that. And we should see more of that in the coming years, I think (Participant G).

> Well, shouldn't we then on our evaluation team... If we're putting a team together, shouldn't we have someone with IT background and experience, on our evaluation teams? I mean, do we? I don't know anybody that has... (Participant J).

These quotations simultaneously highlight a push against a notion of an evaluator as a ‘jack of all trades’, and highlight a need for synthesized relationship-building, and subsequently, emergence of new communities of practice. However, building relationships with other fields for the purpose of joint ICT use presents a new set of ‘growing pain’ challenges, resulting from an absence of a common language. One participant drew on experiences to note,

> ... The only way I can see this as being successful is if you have those skills yourself. If you have computer programming skills and the evaluation insight, I think you can really go far. You can really help clients in a big way and build it for your own practice in your own way that you want to use it. But I am dependent on other people to be able to provide me with that technology (Participant J).

For practitioners lacking these skills, an absence of a common language can result in misunderstandings, a potential waste of resources, and project delays. For example, two participants noted,

> [Programmers] always say exactly that, 'You weren't clear' or 'We thought you meant this', right, and so forth. Look, then you shouldn't have said upfront that you understand the project and that you can make it work. Upfront is a contract, and the contract says you'll do this this and this (Participant J).

> Mobile learning... isn't an area of expertise, and we've been quite dependent on other contractors to help us with the content that we wanted to include. 95% of it wouldn't fit. We had bad luck with our contractors (Participant D).

These quotations suggest that reliance on external factors such as contractor can act as deterrent for evaluators who may otherwise be interested in experimentation with new tools. These barriers may seem especially daunting if the practitioners are working with an organization in the capacity of an external evaluators, which too positions them as outsiders.

Cumulatively these findings show that factors such as lack of experience and technical skill can contend with other demands. In those cases, practitioners' internal capacities may be spread thin by an added demand of ICT skill development. The pressure to maintain professional competence can be thought of as an external barrier[31]. Lastly, although some participants noted the importance of reaching out to ICT experts, absence of common language may pose an additional external barrier for some practitioners.

Limitations of ICT tools.

A number of participants expressed a lack of trust in technology stemming from the absence of absolute dependability. This was a factor when discussing a range of tools, from those used with mobile data collection to those used for communication. For example, regarding mobile data collection, participants noted that logistical issues can still play a part and present another layer of challenges for data collection. As noted by one participant,

> [My clients] are all hyped up on global data collection, but it's gotta work! In the field... In the middle of nowhere, where there's no internet connection... There probably isn't even an outlet for you to plug into for like a day. I mean, it still has to function then. So, I see people get all the excited because we all know how much faster it's going to make that process, but I also see people intimidated by the... trust. The trust factor is there, and it's a warranted one too (Participant A).

[31] Pressure to improve skills was also identified as a facilitator or driver for ICT use, a point I will return to in the subsequent section.

> ... Sometimes you have to climb on that mountain that you're sure that there is some network and that, so, you try to find ways to get... I mean, there are many, many different types of projects, you also have electricity problems, so you need to have external batteries or you have solar panels to get your energy, or you get generators to get energy (Participant I).

The risks imposed by potential ICT failure can result not only in project delays, but pose a threat to practitioner's reputation and status as an evaluation expert. For example, one participant noted,

> We've got to make sure that it's right the first time. Otherwise, we've lost them. We've lost them, and your credibility goes in the toilet. Your credibility, even though [the error] is technology-dependent. I want to put this in place, it's going to be helpful, am I... sure it's going to work? And if it doesn't, what are the consequences to us from the evaluation standpoint? Does it mean that they abandon the [evaluation]? (Participant J).

The possibility of technical failure introduces an element of unpredictability into the evaluation process, which can naturally act as a barrier for practitioners. A participant mentioned this by drawing on an experience software failure occurred at random. The participant noted,

> One of the biggest barriers I see in my own work, and in other people's too is the trust that technology is going to be there when you need it. That's the reliability that still lacks. I mean, it's a brand new computer, top of the line software. So, you know, it's not that it's old and failing me - it's the best and it's failing me! (Participant A).

This suggests that for a context where evaluators have limited access to stakeholders or where time is of the essence, perceived lack of reliability can be off-putting. The opinions expressed in these conversations suggest that practitioners weigh the possibility of failure against the potential benefit, and this can influence their decision to use or not use ICT. In those cases, working with tools that are tried-and-true may be preferable to experimentation. Speaking about the evaluation field as a whole, one participant described this by stating, "It's path dependence, it's become the traditional way to do things, and therefore, it simply persists even though there are easy alternatives" (Participant N). This posits that evaluators may not be not driven to try new tools purely for the sake of innovation - such innovation must have a potentially positive bearing on

their practice, and this bearing, from the perspective of the participants, must be concretely understood before implementation. The tools are chosen selectively and purposefully, and evaluators do not appear to harbour any illusion about their present limitations. This is noted by two participants, who stated that,

> It can solve some problems and certainly make your life easier in many respects, but the seamless system that will do everything for you is a bit of a pipedream (Participant O).

> It's a tool, it's not a solution. I've come to the realization that it has to be wielded carefully, and it's really... it's just a tool, like anything else. You just have to know when to use it, and when not to, and understand its strengths and limitations (Participant C).

These findings suggest that ICT tools are scrutinized with the same level of evaluative standard that evaluators are so familiar with. The paradox is that for some evaluators, particularly those who are just starting to use ICT tools in their practice, using what is ‘traditional’ may be preferable if it is in fact dependable. In contrast, what one participant called ‘easy alternatives’, even if considerably more innovative, may be foregone if there is possibility of failure. One other participant described this current state of affairs, and noted,

> Maybe evaluators in general are not aware of the different opportunities that might exist for us to grow our practice, and make our practice more effective using technology, but maybe as a group of professionals, we haven't been as good about communicating how technology can improve our practice, or augment our practice, or offer new opportunities for our practice, as we could have been. Because if we were doing that, as a group, I think we, as a group might feel more hopeful, right, we might feel like, 'Oh my gosh, I want to do this! This is a new way that this might help me be more useful for my clients' (Participant L).

Three participants also expressed their frustration with ICT tools in terms of lack of fit with the needs of evaluators, each expressing a different concern. For example, two participants underscored that certain data is becoming more favoured by funders because it is easier or cheaper to collect via mobile technology. One of the participants noted,

> Because it's so easy to survey electronically, I worry that people aren't developing their capacity and their willingness to engage with other forms of data that might just as rich or richer, for their purposes. I see that as a limitation of technology, actually. And people think that because they have access to SurveyMonkey where there are preformed

> questions, or because they have Qualtrics, or because they have GoogleForms, now they can create surveys very easily, but that doesn't mean they're creating very good instruments (Participant L).

Despite the benefits in the form of convenience and speed, there is a potential for missing the big picture if more nuanced qualitative insights are overlooked. Another concern, voiced by Participant A, is that certain tools are not built with evaluators in mind. This participant expressed this by saying, "I think that people still run into... functional problems, like 'How do I functionally use this in the ways that I need it to work for me?'" For example, in the context of data visualization software such as Tableau, this includes in-built defaults or one-size-fits all features that neglect evaluators' needs to customize visualizations to fit the unique needs of individual projects or clients.

Budgetary constraints.

Budgetary constraints were noted by a number of participants as being a barrier to ICT use, irrespective of the context of their practice. For evaluators working on smaller projects, this included the cost of purchasing software licenses for data storage solutions and data visualization platforms, whereas evaluators working with large-scale organizations noted the cost of mobile data collection and big data systems to be a concern. For both groups of evaluators, the evaluation budget – which is typically established ahead of time - determines the scope of what is possible to achieve in an evaluation project. As noted by one participant,

> Developing a dashboard or something like that, that's going to take time, and that's not always included in our budgets as evaluators. You have to be very, very cognizant of that before the evaluation starts, and sometimes you don't know what kind of technology you're going to need when you negotiate an evaluation contract. So, that, I find that kind of challenging, because as the consultant, you can end up eating that cost sometimes (Participant D).

As noted in the ‘Evaluator skills’ above, the cost incurred by the evaluator can be detrimental if the ICT tool used for the purpose of the evaluation requires additional learning, and thus it can be difficult to attribute a dollar value to the investment of time required.

As was expressed by one participant (I), some donors and funders may not immediately associate the use of ICT tools to ‘traditional’ evaluation, especially particular aspects of evaluation such as the communication of methodology to the stakeholders, which explains how data was obtained and why it was costly to do so, and; the dissemination of results, which can use ICT tools to summarize the evaluation findings for consumption by wider audiences. This suggests that a bigger budget can, perhaps unsurprisingly, control the scope of technology access to evaluators. In situations where access is not an issue, investment of time and inability to bill the customer for expenses related to ICT use may continue to be a barrier to external evaluator practitioners until the use of these tools becomes commonplace and constitutes a new part of what is still seen as ‘traditional’ evaluation.

Ethical Considerations.

Participants noted a number of ethical considerations that challenge evaluators engaged with ICT. For example, the digital divide is a concern for all stages of evaluation as it can significantly limit inclusion and participation of some client organizations. If these organizations are under-funded, such as those operating in the non-profit space, as noted by one participant (O), their knowledge and use of cutting-edge tools such as big data may be curbed. As one participant summarized, “[Some] people are not in this world, and are as far as I know, most of [them] are not the well-educated, but the undereducated and poor people. That’s, of course, a problem, they are not part of this” (Participant F). Connected to the issue of digital divide, one

participant also noted that the growing emphasis on ICT use, such as mobile data collection, can at times unintentionally diminish the role that communities play in co-creation of the data. The participant elaborated this by stating,

> There's a move towards very quantifiable things because then we can count them using technology, and more simplified data rather than qualitative processes. And then, there are sometimes issues with people spending less time face-to-face with communities, and basically spending all their time behind a device or on a computer, trying to understand data that's coming in versus working together with communities to interpret data. What does the data that's coming in actually mean? (Participant B).

This suggests that the effect of the digital divide can not only limit active participation of organizations, but also that of intended program beneficiaries programs are meant to serve. The ongoing trend for open or free data fail to tackle issues around informed consent, which can also negatively affect intended beneficiaries and other vulnerable populations, as the participant added,

> ... There are not always the skills required to make sure the data is not creating risk for those who provided it, or the data's got... you know, sometimes it will have location information that could put people at risk, if that location was shared with the general public, that sort of thing. And it's becoming quite easy to match datasets or combine datasets, and while that information may seem anonymized... that once crossed with another dataset, it's not anonymized any longer. And so, there are some examples of that happening as well, and putting people at risk (Participant B).

One participant (G) also pointed out that as tools become more widely available, questions of data security and privacy may be overshadowed by potential benefits such as reduced cost, availability or visually-appealing design. Questions of who owns the data, where they are stored, and how well they are protected can become overlooked, as a number of participants noted. For example, one participant stated,

> I mean these data are for free, everything is for free, but the point is everything the researchers are doing is using Google Analytics, etc. That's also for Google. All the data are Google. I mean all your... your pulse, your Apple watch, your movements on your Samsung or Apple. So, the ownership of the data, that's the problem (Participant F).

Questions of ownership is just one of many ethical implications about ICT use. However, the possibility of causing unintended harm may continue to act as a barrier until evaluators have a better sense of what ethical obligations exist in the increasingly digital frontier. All these challenges warrant wider discussion, especially pertaining to an updated code of conduct, as one participant noted below,

> I think that it would be great if some of the [evaluation] societies, you know, supported their members to learn more about these different tools, and I think some updated ethical standards would be great, in terms of digital data ethical standards and digital consent ethical standards. There are some organizations working on this, but there hasn't been a broad movement, I don't think, within the evaluation community, to take a second look at updating some of the ethical frameworks to kind of come into the new digital age (Participant B).

This quotation highlights that there may be an important role for professional associations to play, a point that I will return to in the Discussion section.

To summarize, using ICT in program evaluation is not always straightforward. Throughout these interviews, participants discussed a number of challenges that can be encountered in practice. At the level of organizations, evaluators who already possess proficiency with ICT tools have noted the likelihood to encounter organizational pushback or lack of internal capacity to use of ICTs. At the level of evaluator, however, practitioners who are now entering this sphere noted that lack of technical skills can also be a considerable barrier to entry. Lastly, at the level of technology, incompatibility of ICT tools across diverse contexts was a noted challenge. According to the participants, this can manifest in both technological limitations, as well as larger ethical inappropriateness. These three levels of barriers imply that ICT use in evaluation is characterized by different challenges that are characterized by context. This suggests that there may be three scenarios that result in somewhat of a lack of fit. In the first condition, the evaluator assumes the role of the ICT ‘expert’ whose skills may be at odds with clients’ organizational culture, resulting in ICT abandonment. In the second scenario, the

evaluator is an ICT novice that faces internal and external pressure to develop new skillsets outside of the regular zone of comfort. The last scenario that results in a lack of fit pertains to the technical limitations of technology itself. The conversations with participants illustrated that certain tools can be too simple while others are unnecessarily complicated for evaluation work, which may make them impractical for certain projects. Budgetary constraints and ethical considerations add another layer of complication, contributing to lack of fit from a practical standpoint.

Facilitators and Strategies to ICT Implementation and Use in Evaluation Practice.

Participants were asked to discuss what strategies or factors facilitated ICT use in their practice. In line with the major theme identified in the literature review, being purposeful about ICT implementation and use was drawn from the conversations as an overarching theme and main strategy. A number of other facilitators were surfaced, some emerging as solutions to the barriers presented in the section above. These facilitators were: cultivating organizational buy-in and capacity for ICT use, and; responding to pressure to improve skills.

Being purposeful about ICT.

The majority of the participants stressed the importance of being purposeful about ICT implementation and use. This entails revisiting participants' needs, and likewise, the purpose of the evaluation to gauge when and how ICT should be used. One of the participants (B) reiterated the importance of linking ICT to the concrete questions that require answering, voicing this in two statements,

> Being able to set out what the data is that you need and making sure that that data is the data that are required to prove a particular point is the underlying question that folks may not always get

> right. So, that's what I mean when I say that technology can do these great things but you have to have the underlying question right, and you have to be sure that the data that that are being collected are actually answering the questions then that you're trying to answer.
>
> Like with any tool, it's really important to first know what you're trying to do, so rather than starting out saying you're going to use technology, it should be more of... starting out... you know, trying to figure out what you're trying to do and who you're doing it with, and what their access is to technology tools, what their experience is, how well they know how to use them. It's really important.

This reiterates purposefulness as a principle to guiding an ICT strategy. Gay and Bennington (1999) noted that the contribution of a technological tool depends on "particularities and exigencies of different evaluation use contexts, differing approaches to evaluation, and different situated evaluation activities" (p. 8). These findings suggest that evaluators working with ICT are cognizant of the need to prioritize context and stakeholder needs long before considering implementing technology.

Being clear about what the tool is going to accomplish was another tactic, both for managing stakeholder expectations and limiting the scope of the evaluation. For example, speaking about interactive logic models, one participant noted that by failing to explain the scope of this tool to stakeholders, the process of logic modeling, the purpose of which is to clarify program entities and objectives, became unnecessarily complicated. The participant described this experience in the following statement,

> ... The assumption was that... at least for the stakeholder... that anything and everything can be placed in this thing and that really, no conceptual prioritization needs to happen, and so, when we set that expectation that we can do anything and everything, then nothing went off the table, and any and all stories and connections could be placed in this thing. And it could. Technically, it could, but ultimately, the final product was subpar in many ways, mainly because it failed to achieve anything that we were trying to achieve. It ended up biting us in the end (Participant C).

This statement reiterates the common theme that emerged throughout the interviews that there is a time and place for ICT use and that no context is alike. Powerful tools lose their power when

introduced in the wrong circumstances, as a number of participants repeated. Closely related is the issue of organizational capacity, which I will discuss next.

Cultivating organizational buy-in and capacity for ICT use.

As I noted earlier, stakeholder anxiety about ICT use is something that participants commonly encountered in their practice. In response to this barrier, participants spoke to the importance of gauging internal capacity of stakeholders and their organizations. For one participant, navigating anxiety is also part of navigating the context. The participant spoke to the importance of taking things slow and simplifying processes for stakeholders not only new to technology, but new to evaluation. The participant noted,

> I've learned this over the years, it is not about changing their organizational mindset to be more critical, because that's just way too big of a goal to start with. It's about ... getting people excited, providing something useful upfront (Participant N).

Another participant (G) spoke at length about juxtaposing capacity against a menu of ICT options, and choosing a strategy that respects internal challenges while also gradually building up capacity. This approach of "meeting clients where they're at" (Participant C) entails communication at the forefront of the project, followed by a tailored approach that increases or decreases emphasis on ICT according to user preference. Connected to this, a number of participants also spoke about the importance of building on existing IT structures without burdening the client and their organization. A participant (G) heavily relying on this philosophy spoke at length about this approach, noting the following on two occasions,

> It is worthwhile to work with people's capacity to understand the tech, but also to make everything as simple and direct as possible by offering opportunities for them to go deeper into different areas if they choose, by creating those kind of linkages too. The tools I usually end up on are ones in which... that the team itself can adopt, even in bigger budget projects. So, I have to always design with that in mind, and not take something that is too technical for the clients to take over and work on in the future. I've worked with a lot of people who are really not tech-

> savvy to create technical work and communications work and a different approach to the web, and it's usually step-by-step.
>
> It's almost with everybody, even the more tech-savvy - if they're busy, they need to be spoon-fed everything in the same way. Connecting, making things as simple as possible, is the only way to really kind of connect with people, and get people to use anything. There are lots of tools, there are lots of approaches, and I think what has worked well for me, is to not to be tied to any one tool or any set of tools, but to keep an open mind and base it on the challenges faced by the participants. The tools that have worked really well for me tend to be tools that are focused on meeting specific needs, and work really well for a given situation.

Just as context can act as a barrier, some participants spoke to the role that organizational support plays in enabling ICT use. This can include having buy-in from the right people, as one participant mentioned,

> Integrating and incorporating ICTs in a smart process-oriented way that is based on what you're trying to achieve and who your audience is, what the connectivity is locally... There are so many different factors. If those factors are taken into consideration and you have buy-in from the right people, then I think it can be extremely positive, but if you just kind of go about it haphazardly, then I think it can be quite negative (Participant B).

Buy-in can be inherently present in the context, or it can require cultivation and mindful strategy on the part of the evaluator. A number of participants noted that clear communication about potential benefits and drawbacks can ease the process and foster enthusiasm and support for ICT use. Two participants explained,

> Just a clear explanation of what can and can't be done, and setting expectations correctly. I've made the mistake in the past of presenting it as 'This is going to solve everything', rather than being more realistic about what it can and can't solve, and so... that's always helped (Participant C).
>
> Using a good change management intentional approach is critical... Communicating about it, helping to show the easy wins, there is really good literature that can kind of guide your thinking on stuff like that. So, maybe starting small. I mean, be ambitious about what you want to do, but be realistic about what you can do (Participant O).

These quotations suggest the need for flexibility and user-centred design in building a purposeful and needs-informed ICT strategy.

Much like cultivating buy-in, building on existing capacity can perceived as a ‘static’ facilitator, whereby the evaluator assesses the existing system and works within those parameters, or; it may be an action-oriented facilitator, that is to say, the evaluator consciously adds to the existing structure by building organizational capacity to use ICT, and potentially facilitating future ICT use. Speaking about an experience in which one participant facilitated one organization’s access to better tools, this participant noted,

> I don't like to get involved in the implementation parts of a project, but I just happened to be in that situation where I knew all the different stakeholders, and I know they didn't know each other, brought them together, and just by bringing them together, it's like suddenly I became the person responsible. I mean, technology in that sense, has nothing to do with the evaluation as much as it is a need derived from an evaluation. And of course, we evaluated whether that technology was working as it should or any better, but the actual impetus for the project is really just, 'Oh, you've got a problem here.' I should have just said, 'You've got a problem, here might be a way to fix it'. I almost guarantee that nothing would have happened. So, okay, I'll pull the people together and help actually fix that problem, but I don't know... I don't know if that's a good role for us to be involved in (Participant J).

The above quotation raises a question about what role evaluators should be performing in the coming years if and when ICT gains prevalence in our practice, and whether such deep involvement in capacity building should be considered a new aspect of evaluators’ role. At the present time, this remains an unanswered question, but one that is worthy of future discussion and research.

In summary, organizational capacity is both a barrier and facilitator for ICT implementation and use, much as it is for evaluation use as a whole. Just as evaluators often lament ‘evaluation reports on dusty shelves’, the participants that I interviewed seemed cognizant that ICT not attuned to the context can meet a similar fate.

Responding to pressure to improve skills.

Some participants spoke about improving their knowledge and use of ICT as a take-

charge response to perceived pressure to keep up with current trends. This entails building upon skills that, at this present time, are considered a niche within the wider field. While this was also framed as a barrier, the need to proactively build skills and maintain employability was also framed as a driver for ICT use. As expected, for some participants who had defined themselves as 'tech-savvy', experimenting with ICT and proactively improving skills may come more naturally. For example, one participant noted that,

> I am interested, just generally, in technology in evaluation. It's something I continue to be interested in, I guess, and try to integrate whenever I can. To see if it works or doesn't work (Participant C).

> I've always been... in every organization, there is always one person who is kind of 'good at computers' person, and that's always just kind of been who I am. [The gap] behooves me, as an independent consultant, to develop that and make that my niche, so that people can think of me as an expert in that area, in addition to the fact that I think it's useful and important for evaluation (Participant M).

For participants who are new to ICT and may be seeking to enhance their toolbox, the pressure to improve is a more forceful driver. As one participant stated,

> There's innovators, the early adopters, and late adopters, and then there's the laggards. And you know, in 2008, there were lots of innovators and early adopters, and now, you know, we're moving through, but some of evaluators naturally have these kinds of skills. [Data visualization] is not a typical skill of somebody who comes up through the ranks of science as much of us do as evaluators. It's not good to be a laggard in this area now (Participant D).

Another participant drew a connection between the need to improve skills and meeting demand that is rooted in the context of the evaluation. Referring to evaluation in education, this participant explained,

> ... When you are trying to collect data from students and teachers who are using technology in ubiquitous ways as part of their learning environment, that it has a real role to play in our evaluations, and evaluators have a responsibility to understand how to use it effectively (Participant L).

This time referring to the international development field, another participant noted a similar need to uncover grasp how ICT is impacting evaluation work.

> We found that there was a huge need among the evaluation community and the organizations that work in international development to better understand how some of these processes can be put in place, what the downfalls are, what the upsides are (Participant B).

Since evaluators are commonly employed in different fields, the incentive to keep skills up to date may be connected to ICT developments emerging specifically in those fields. This can also mean looking beyond the horizon in order to anticipate what skills may be in demand, as one participant explained below,

> ... Evaluators, unfortunately, have not been, you know, running up front. They simply don't know what is happening in the world with regards to these developments, and that is very bad. Evaluators shouldn't be, you know, waiting and waiting, till the political, or policy maker, or stakeholder, or whatever it is, is getting, you know, a little more moderate, and is going to ask [for] big data... I mean, growth of knowledge is produced by making combinations that weren't there before, and if the evaluator continues to wait until [...] has understood that here is something like Quantified Self, then other people will have been taking the windfall profit, and they are going to do better work, and then ten years later, when the bureaucrats start to get awake, they will not call the evaluator because the evaluator has also fallen asleep (Participant F).

Together these quotations reveal that participants are cognizant of the encroaching change ICT brings to the field of program evaluation. Another way of thinking about this finding may be in terms of internal and external drivers for change. For example, for some participants who are comfortable with technology, the driver to accrue new ICT-related skills is somewhat of a modus operandi and thus an internal driver. For other participants, on the other hand, skill development in what may be an unfamiliar area is driven by an external force – such as perceptions of global trends, for example. The common thread among these findings is participants' proactive stance towards skill development.

Strategies Used for Cultivating Evaluation Use.

Participants were asked how they approach evaluation use in their practice, with or without the use of ICT tools, and offered rich and detailed feedback on their strategies

employed. Given that the role of ICT in promotive interaction was to facilitate other strategies, gaining insight into these strategies is quite useful. In that sense, understanding how evaluators engage in promotive interaction as a whole can provide an additional layer of understanding of how the ICT piece fits into this puzzle.

The responses received were coded according to process-focused and output-focused strategies. Process-focused strategies included stakeholder involvement, strategic communication, after-the-project follow-ups, and resource management; whereas output-focused strategies were related to the quality of final reporting. In that sense, these strategies can be helpful for brainstorming about and achieving different forms of evaluation use. These categories will be discussed below.

Process-focused strategies.

In my conversations with the participants, it became apparent that evaluator practitioners may be tackling use by 'reshuffling' how the process itself unfolds. The strategies included here very much pertain to *how* to do evaluation rather than strictly *what* to do – as overarching principles, rather than ingredients for an exact recipe.

Stakeholder engagement.

Stakeholder involvement was the theme most prominently mentioned by stakeholders as being a strategy they use for increasing evaluation use. Some of these participants also referenced 'collaborative' and 'participatory' approaches to evaluation. These kinds of approaches typically place emphasis on co-creation, that is, engagement of users at various stages of the evaluation such as data collection, analysis, interpretation, and the finalizing the

recommendations. The quotations from the participants below illustrate how this occurs in their practice,

> ... The logic model and the evaluation framework are always co-developed. I usually get their input into data collection tools, and the second place where I try to engage them is through a data party, so, once I've done my first round of analysis of the data, instead of kind of formatting into a nice report, I just put into point form and I meet with them and I have them look at it. And say, 'Is this what you expected? Does anything surprise you? Why might this be occurring?' Questions like that. And we either co-develop or co-create the conclusions or recommendations together, or I give them a draft and get their feedback on them (Participant D).

> We ensure that the evaluation is used by engaging the client throughout the entire evaluation process, in a very on-going, data-sharing process that begins prior to the report being written (Participant E).

These strategies can be executed in a variety of ways that vary from case to case. The objective, however, is to build capacity and ownership, as noted by this statement,

> And those joint analysis sessions, to me, seem quite pivotal to getting people invested in using the end results, because it seems like without that capacity to work together to jointly analyze the data, it's easy to dismiss the results as something someone else, who is not part of us, came up with (Participant N).

Stakeholder engagement was also seen as an opportunity to imbue interest, and to capitalize on early positive experiences which can be provide momentum to a project.

Strategic communication.

Participants spoke at length about the importance of strategic communication. This included such tactics such as ensuring agreement between the evaluator and stakeholders from the start of the evaluation, and establishing feedback loops to ensure that the client feels heard. In comparison to stakeholder engagement discussed above, strategic communication is related to *how* or *when* the actors will communicate. In essence, this might mean that for some participants, strategic communication relates to design factors that enable stakeholder engagement.

Creating communication plans was an example of strategic communication, as some participants stated that it helped them prepare the client for what was to come, and ensure that the client was not left surprised by the final report nor the submitted list of recommendations. For example, two participants noted,

> When the final report comes, it's not any new information. We have already discussed everything I have found, as I have found it because I've been asking questions, and saying 'Hey, does this fit with what you think?', and so, when we do get together to talk about the final report, as I said it's not new information, so, we really just make an action plan of what are we are going to do now, now that we know this stuff. What are the next steps that we're going to take? And that's a very critical way of using... of making sure that evaluation gets used (Participant A).

Determining the strategy for communication can also provide momentum and give an opportunity for the evaluator to make any necessary changes. As one participant explained,

> The best model that's worked for me that I've already shared with you is, we meet before... We say, 'Understand, this is how you want the report, the information, are you comfortable with all of that? Yes? Okay. If you're comfortable with that, then I need some answer on these recommendations within... do you guys meet monthly, do you meet every two weeks, do you meet daily? When, in your normal schedule of things, would this come up? And I need to know that you're going to do that, because I need to know... if it's not useful, I need to know that so that I can make some adjustments.' I need some type of say on what they're doing with these recommendations, so that's how I kind of move the client forward in that way, is with... again, I'm not sure I'd do that twenty five years ago, but I do it now (Participant J).

This participant also explained that this strategy helps to manage expectations and build commitment in the evaluation. This can also provide structure to the evaluation, and offer clarity about roles and responsibilities.

Participants also spoke to the importance of providing feedback whenever opportunity allows, as this was seen as a way to create a learning loop and, as one participant (L) stated, allow stakeholders to feel heard, rewarding their investment into the evaluation process without overwhelming them. Rapid or frequent feedback was also mentioned as an important strategy, especially for contexts where changes to programming can translate to significant benefits, such

as within programs related to health or safety. Such programs, as one participant explained, benefit from rapid feedback which allows them to evolve quickly and improve service provision.

After-the-project follow-ups.

A few of the participants in the study spoke about learning about the importance of following up on use after the project is over. For two participants, following up made up an integral part of their practice and a component of self-evaluation and practice improvement. One participant noted that,

> So, yes, that's a regular part of my practice... because I'm really interested in evaluation use, and whatever it takes to make the work more useful and I can sometimes only find that out retrospectively. And I try to attend to use as a dimension throughout the evaluation work, but sometimes you don't know what you don't know. So, that's another thing that I do, and then, lately the thing that I started doing is, 'Okay, now that the report has been produced, let's talk one more time. How are using it? Where do you need support? What kinds of questions are you asking? What are you thinking about?". So, there is that kind of like a post-session now, which is a new one for me, almost as an expectation of the way that I do work, and if you want to work with me, this is the way that it works (Participant L).

This suggests that to track use, some evaluators choose to go beyond the traditional project cycle, which can inevitably demand resources, including time borrowed from other projects. One participant noted that while tracking use has been a priority, some stakeholders are not as forthcoming about how they use their findings, which leaves the value of use undiscovered.

Resource management.

The last process-focused strategy mentioned by participants was resource management. Evaluators spoke about the need to manage their time to ensure that projects received the necessary support, and as one participant explained, "Balancing the amount of time and effort I spend on projects, relative to what I think ... how much the clients are actually going to use it" (Participant M). Resource management also denoted the importance of reducing burden on the

stakeholder. For one participant in particular, maximizing use meant prioritizing feasibility, and capitalizing on what data or communication flows and technology systems already exist.

Output-focused strategies.

Participants also spoke at length about maximizing the use of findings by focusing on ensuring that all products exhibit qualities such as being 'actionable', 'concise', 'visual', and 'user-friendly', in addition to diversifying a range of outputs for different audiences. Compared to process-focused strategies, this approach differs in focusing on evaluation ‘products’, or the ‘what’ rather than the ‘how’. The emphasis on these strategies was accompanied by the belief that traditional evaluation reporting can be ineffective and burdensome to stakeholders, especially those not familiar with evaluation. As one of the participants noted,

> I don't think that technology has changed the way that people feel about evaluation. I think that they still dread it, completely. I don't think that technology has touched that one bit. But what I have seen in my consulting practice, where we're helping people with their data visualization and design... is I've seen people take... Evaluators work with me using technology to make something like an infographic or something along those lines that almost hides the fact that this is an evaluation, right? And it's really always at that stage, about reporting out... about disseminating out... how do we get the community to take action about what we found in our evaluation work, and that's where, you know, technology... That's where I use technology with my evaluation clients to make the dissemination of the findings way more digestible, and doesn't look like anything like a traditional evaluation report (Participant A).

This suggests that some evaluators are aware that stakeholders' negative perceptions of evaluation may be rooted in past experiences, therefore, as noted above, creating experiences that do not resemble 'traditional' evaluation becomes a priority. This can require a diversified set of skills, as I will touch upon in a separate section of this thesis.

Participants also spoke about the importance of building products for specific audiences, which sometimes meant the use of layering techniques, that is, the production of various products each of which is meant for a unique audience. In some cases, this means a simple

strategy of dividing a traditional report into two parts: an executive summary and a longer document (as noted by Participant C), while in others, this may entail exercising foresight to diversify a range of products, as noted by this quotation,

> And so, whatever products we're doing, for instance, beyond writing a report, we're going to try to think about how to write that report in such a way that it could be easily broken up and re-made into other products, if someone came along a few months later and said, 'This material would be good for something else'. So, we want it be re-used (Participant N).

These findings suggest that the participants in this study are cognizant about building evaluation use into their practice, but strive to do so in ways that give evaluation a 'fresh face' and its stakeholders a new range of experiences. By 'dressing up' the output in an unlikely way or by reacting to user needs, the importance of output-focused strategies remains the same - for the stakeholders to latch onto evidence and, hopefully, to lead to the forms of use identified earlier in this chapter.

Summary.

In this chapter, I presented the results of Study 1, the first component of my exploratory thesis study. The data emerging from this helped to surface a number of important findings regarding the use of ICT in program evaluation practice. By first exploring participant perceptions of evaluation use, which turned out to be multifaceted, I also explored how ICT is seen to contribute to this end goal. Participants' perceptions of what makes evaluation 'useful' and how they know that 'use happened' also in turn influences how they may or may not interact with ICT. As such, what role ICT will play in promotive interaction can vary substantially over evaluation practitioners.

The interview analyses helped surface the finding that participants regard ICT as a tool within a diverse toolkit; not the most reached-for tool, but one used to complement other

ongoing processes. In that sense, ICT is being used to add value to strategies that may be tried and true, as opposed to as a method of replacing those strategies. Consequently, even though ICT factors into the evaluator's role as a facilitator of use, its effect on evaluation use is an indirect one. This is especially the case for 'background' processes, that is, the technical tasks performed by the evaluator. In this aspect, ICTs such as mobile devices and data storage solutions can facilitate evaluation by increasing efficiency, speed, quality of findings, and sometimes, by reducing costs. ICT can also, but to a lesser degree, influence 'foreground' processes that involve or in some way implicate clients and other stakeholders. In this aspect, ICTs used for collaboration and communication purposes can help evaluators extend their reach by involving more stakeholders, and by aiding the sense-making processes that occur within the team. The findings also suggest that, at the present time, the role of ICT in evaluation is more closely linked to learning about the outcomes of a particular evaluation exercise, than to the evaluation process itself. More specifically, ICT tools have the potential to enable clients and stakeholders to become better consumers of evaluation findings. This is especially the case for data visualization tools and approaches, which have the potential to improve reporting and data sense-making. This does not preclude that ICT has no value enhancing process use, but the findings suggest that stakeholders may simply not be using these tools enough to make a difference for process use. In other words, if stakeholders themselves are not taking a hands-on approach to technology, for example, electing which tool to use, devising a use strategy, manipulating and analyzing the data, or playing an active role in preparing their own findings – their perceptions of ICT may be limited. Interestingly, a number of participants spoke to the importance of stakeholder involvement as a strategy for use. However, the findings also show that evaluators too tend to regard various technologies with a degree of caution. The reason for

this is that evaluators may be facing a number of challenges that prevent them from using ICT more widely, especially in actively teaching stakeholders about evaluation. As a result, their approach to promotive interaction – their overall approach to building an environment conducive to learning – relies heavily upon interpersonal dynamics, and from that, good relationships. In summary, according to participant feedback, promotive interaction is sustained by these interpersonal dynamics, and it is from them that evaluation use stems. The role that ICT plays can help advance evaluation use further by supporting these dynamics, and by adding value with respect to findings use.

Participant feedback point to a complex interlay of drivers, barriers, and facilitators to entry for ICT use in evaluation. These turned out to be different depending on evaluators' point of entry into ICT work, in other words, their level of technical proficiency. However, budgetary and ethical concerns remain important factors that evaluators across the sample were cognizant of and continued to underscore. These findings informed the evolution of the conceptual framework, which now highlights the importance of contextual variables. The delineation from the original conceptual framework underlines that context may be an antecedent, playing a foundational role for evaluation and setting the scope and parameters for what it can achieve. The feedback also helped corroborate stakeholder and evaluator roles that were depicted in the original framework, suggesting that these two elements have an important role to play in achieving evaluation use. Although positive relationships were identified to be an important component of the original framework, my findings suggest that they are a result of process-focused strategies and ongoing effort by both parties. Participant feedback also helped situate technology as a contributor that exists on the periphery of promotive interaction, rather an attributor, which the updated framework also reflects. In the cascade design employed for this

research, these findings helped to shape the quantitative phase of the research which I will discuss next.

Chapter 5: Study 2 - Quantitative Findings

As noted earlier, the purpose of Study 2 was to collect complementary quantitative data that would further build on the findings that emerged from Study 1. The Study permits us to gauge the extent to which Study 1 results generalize to a wider sample of participants by confirming or disconfirming results from that inquiry. Participants were asked to provide their views about the general use of ICT in their practice, as well as offer information related to a specific recent project that used ICT. The objective for this latter part of the survey was to contribute to our understanding about the perceived value of ICT in process and findings use, and explore how these tools relate to other 'moving pieces' within the evaluation process and prominent components of the conceptual framework guiding the research – evaluator and stakeholder involvement, and the quality of relationships between them.

The following chapter presents the findings of Study 2 beginning with a review of descriptive statistics obtained from the data using SPSS. It then explores a number of bi- and multivariate analyses that were conducted.

General Views on ICT

The first section of the survey probed participants to reflect on the value of ICT in their practice in a more general sense. This introductory section posed 11 questions with a 5-point frequency Likert scale. The first set of questions asked participants to rate the frequency of use, divided into evaluation phases such as planning and data collection. Table 5 below displays the results for this section.

Table 5
Perspectives on general use of ICT (A1)

Items	N	Response distribution %					Mean	SD
		Never	Rarely	Sometimes	Frequently	Always		
Communicating with stakeholders (e.g., video conferencing, interactive whiteboard, team collaboration outlets)	333	6.9	15	21.9	**41.4**	14.7	3.42	1.12
Planning (e.g., interactive logic models, project management software)	333	14.7	26.1	**27.0**	16.8	15.3	2.92	1.28
Data collection (e.g., mobile phones, social media, photo/video monitoring)	332	7.5	16.3	27.7	**29.5**	19.0	3.36	1.18
Data analysis (e.g., system mapping, big data, qualitative or quantitative analysis software)	331	5.1	8.5	14.5	30.8	**41.1**	3.94	1.17
Reporting (e.g., data visualization, digital storytelling)	328	6.4	9.8	22.6	**32.6**	28.7	3.67	1.17

There was modest, yet consistent variability across the five items in this table, with SD slightly over 1.0. Data show that participants were most likely to use ICT for data analysis with the average of response being just shy of 4.0 'frequently' on the 5-point scale, followed closely by ICT for reporting. Tools used for planning purposes were least selected, with an average below the midpoint on the frequency scale. This corresponds to the findings from Study 1 where interview participants spoke at length about not relying on ICT tools in the planning stages of the evaluation, but instead on prioritizing communication and relationship-building amongst the team members. ICT tools for communication averaged close to 3.5, which suggests that reliance on these tools may be periodic rather than regular. This too was alluded to by Study 1 participants, who noted the importance of in-person and face-to-face interaction in initial stages of the evaluation process.

The second set of questions in this section asked participants to indicate how often, in general, they use of these tools adds value to their practice, thereby exploring their motivations for including ICT into their evaluation toolkit (see Table 6). We can see in this table that variability, although consistent across items, was relatively constrained because the response distributions were skewed toward the more frequent end of the scale. The data suggest that participants may see themselves as 'frequent' users of ICT, and appear to strive to include ICT in their practice. These tools are also perceived to add value to evaluation practice. Of the motivators, improving the quality of findings achieved the highest average score, whereas helping to reduce costs was received the lowest average score, however the difference between the two scores was modest. It is important to note that stakeholder engagement received a relatively low average score, signifying that technology may be seen as only occasionally useful for this aspect of evaluation.

Table 6

Perspectives on general value of ICT in participants' evaluation practice (A2)

Items	N	Response distribution %					Mean	SD
		Never	Rarely	Sometimes	Frequently	Always		
ICT helps to reduce evaluation costs	334	1.2	9.9	**42.8**	34.1	12.0	3.46	.87
ICT helps to improve the quality of evaluation findings	335	.9	8.1	34.6	**41.8**	14.6	3.61	.86
ICT enhances stakeholder engagement	332	1.8	7.8	**42.5**	37.7	10.2	3.47	.85
ICT adds value to my evaluation practice	335	.9	4.2	26.0	**46.0**	23.0	3.86	.85
I try to incorporate new technologies in my evaluation practice	335	.9	10.4	34.9	**36.4**	17.3	3.59	.92
Overall, how often do you rely on technology in your evaluation practice?	335	1.5	5.4	17.9	**44.5**	30.7	3.98	.92

Most of these average responses hovered between ‘sometimes’ and ‘frequently’. This is curious given that this section of the instrument screened out potential participants who identified themselves as low users of ICT, suggesting that of those participants who passed the screening criteria, technology use may be occasional as opposed to habitual. This occasional use in turn suggests a level of judiciousness concerning how ICT is used – something that also emerged in Study 1. In other words, if participant’ average scores point to technology being used on occasion, the use of these tools likely varies from project to project. It is also interesting that of the three motivators: reduced cost, stakeholder engagement, and improved quality of findings, it is the last motivator that received a slightly higher score, suggesting that data quality improvement may be a more tangible motivator for participants.

Past Project Characteristics

The remainder of the instrument delved into exploring project-specific experiences of participants. The objective of these questions was to elicit more detailed information about how ICTs fit in to the evaluators’ approach. First, participants were asked 6 mostly check-all-that-apply questions that established project criteria. These were: evaluation purpose, sector, design, data type, scope, and duration of intervention. The intent behind these questions was to explore what sort of project setting ICT can be used in in evaluation practice. The results from these sections will be discussed in the following paragraphs.

The data for evaluation purpose (see Table 7 below) show that summative evaluation was most commonly selected, with mentions in 69.2% of cases, followed by formative evaluation with 60.6% of mentions. Developmental evaluation was least selected evaluation purpose with 31.1% of mentions. From the perspective of evaluation as a function of learning versus

accountability, formative and developmental evaluation types tend to have a learning-oriented focus, whereas summative evaluation tends to be accountability-focused. Interpreted in this way, we can see that the majority of total responses were indeed more learning-oriented rather than accountability-focused. This was in some way consistent with Study 1 findings. Although the types of evaluations discussed in the interviews varied greatly, very few participants in Study 1 identified instrumental use as their sole evaluation use objective. On the contrary, most of the interview participants highlighted the importance of helping clients make decisions by promoting both conceptual use (learning) and instrumental use (accountability).

Participants were also asked to check all the sectors that could reflect the nature of this project (see Table 8 below). While all sectors were represented to some degree, the majority of projects were education sector-related, with over 35% of mentions, as well as community development-related, with almost 22% of mentions. International development projects received only 18% of mentions, which was somewhat surprising given that much of the literature on ICT in program evaluation is rooted in international development contexts.

Table 7

Project - Evaluation purpose (B1) (n=289)

Evaluation type	Percent	Percent of cases
Developmental	19.4	31.1
Formative	37.6	60.6
Summative	43.0	69.2

Table 8

Project - Sector (B2) (n=278)

Sector	N	Percent	Percent of cases
Business and Industry	19	3.4	6.8
Community Development	61	11	21.9
Community Mental Health	30	5.4	10.8
Culture/Heritage/Tourism	9	1.6	3.2
Economic Development	31	5.6	11.2
Education	99	17.9	35.6
Health/Medical	58	10.5	20.9
International Development	52	9.4	18.7
Justice and Corrections	15	2.7	5.4
Labour Market/Employment/Training	18	3.3	6.5
Public Health	55	9.9	19.8
Science and Technology	13	2.4	4.7
Social Research	36	6.5	12.9
Social Welfare	32	5.8	11.5
Multi-Sector	25	4.5	9

Concerning project duration (see Figure 8), responses for short and long projects were almost evenly distributed, with 37.2% and 36.8% respectively. The remainder of projects (26%) were between 1-2 years old. This relatively even breakdown suggests that both short-term and long-term engagements can rely on these tools, irrespective of project length.

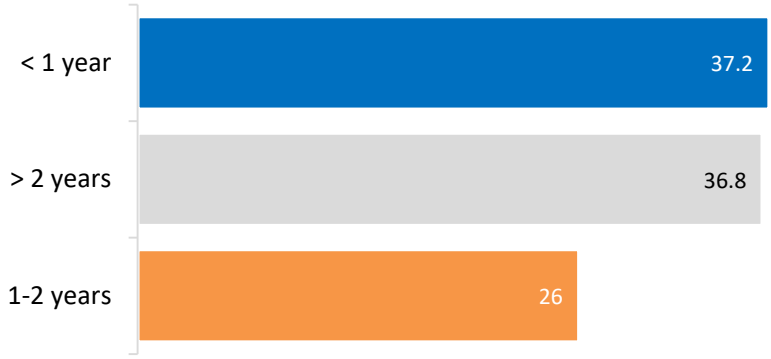

Figure 8: Duration of intervention (B6) (n=296)

The scores for project scope (see Table 9) show that the majority of projects were small scale/local, with 49.7% of mentions, whereas large scale international projects were the least selected, with almost 12% of mentions. However, categorizing projects purely into small-scale and large-scale projects revealed that large-scale projects were the much more prevalent category of the two.

Table 9

Project – Scope of intervention (B5) (n=292)

Scope of intervention	N	Percent	Percent of cases
Small scale/local	145	**39.2**	**49.7**
Large scale regional	111	30	38
Large scale national	80	21.6	27.4
Large scale international	34	9.2	11.6

Lastly, concerning design elements of the project (see Table 10 and Table 11), mixed-method design (80.2%) and a focus on building theoretic understanding of programs (68.2%) were categories with the highest scores.

Table 10
Project – Design elements (B3) (n=279)

Design elements	N	Percent	Percent of cases
Experimental/Quasi Experimental	101	27.2	38.3
Program theoretic	180	**48.5**	**68.2**
Emergent/Naturalistic	90	24.3	34.1

Table 11
Project – Data type (B4) (n=252)

Data type	N	Percent	Percent of cases
Quantitative Only	71	21.6	28.2
Qualitative Only	55	16.8	21.8
Mixed-Method	202	**61.6**	**80.2**

Participants were given an opportunity to provide open-ended comments related to the project. The thematic analysis of the data revealed a number of themes that would otherwise have not emerged, highlighting the importance of mixed-methods research for a topic such as this. A total of 163 participants provided responses, the length and depth of data varied from participant to participant. These data included perceptions of the project's complexity, details about project objectives, and other contextual details.

Regarding project complexity, 60 of the comments remarked that the project was challenging, with scope being the most cited contributing factor. Large-scale projects, such as those commonly discussed here, often engage with a multitude of stakeholders and on many fronts. This entails challenges like geographical isolation among the team members but also a variety of diverse perspectives, sometimes resulting in a lack of cohesive vision and direction for the evaluation. The second factor was related to institutional constraints, which included budgetary constraints, politics, staff turnover, and lack of evaluation capacity. Themes mentioned less frequently were challenges concerning data collection and quality, such as access to participants; technological hurdles, ranging from lack of access to new tools to stakeholder resistance to technology, and lastly; interpersonal dynamics between the evaluator and stakeholders, which in a few cases resulted in lack of participation and deadlock. Contrasting with these responses were another 18 comments that described the project as being largely 'straightforward', whereas 9 comments characterized the projects having an intermediate level of complexity. This was observable by mentions of the projects being simultaneously demanding and not.

Concerning contextual details, a common thread to emerge from the submissions was that projects were often characterized by multiplicity, such as involving multiple partners, crossing multiple regions or sites, and having multiple objectives. Information concerning project objectives also included details pertaining to methodology and project timeframe. Coding these data did not produce uniform findings as projects discussed were truly diverse.

ICT Use in the Project

Beyond specifying project characteristics, participants were asked to elaborate on the ICT tools used in the aforementioned project. Categories presented to participants included tools for communication, planning, data collection, analysis, and reporting. If the average score for their chosen answers exceeded 3, or 'sometimes' on the frequency scale, participants would then be presented with follow-up questions that explored that category further. In each category, four to five examples of tools were included and these included both what could be considered 'mainstream' and established technologies (such as videoconferencing), as well as more novel developments (such as interactive logic modeling software, infographics, or applications of big data for analysis). As noted before, the process for the inclusion of these tools was influenced by participants in Study 1 as well as the literature review. Under each category, participants were also given an opportunity to manually enter information regarding other tools that may have been omitted, however little meaningful data were collected. A number of interesting findings emerged from participants' responses. First, the data from this section again reflected that evaluators seem to use tools for data collection (see Table 15) and data analysis the most (see Table 16), but rely on planning tools the least in their projects (see Table 14). This further aligns with Study 1 findings, suggesting that evaluators may indeed have less reliance on ICT in the planning stage when the evaluation is just being set up.

Table 12

Project implementation – Frequency of use of ICT tools (C1)

Items	N	Response distribution %					Mean	SD
		Never	Rarely	Sometimes	Frequently	Always		
ICT tools for communicating with stakeholders	272	4.0	8.1	20.6	**42.6**	24.6	3.76	1.04
ICT tools for planning	270	10.0	17.8	24.4	**28.5**	19.3	3.29	1.25
ICT tools for data collection	272	4.8	6.6	18.8	**40.4**	29.4	3.83	1.07
ICT tools for data analysis	270	4.4	4.1	17.0	35.2	**39.3**	4.01	1.06
ICT tools for reporting	273	8.4	13.2	23.8	**28.9**	25.6	3.5	1.24

Table 13

Project implementation – Frequency of use of ICT tools for communication (C1-1)

Items	N	Response distribution %					Mean	SD
		Never	Rarely	Sometimes	Frequently	Always		
Video conferencing	227	19.8	10.1	25.6	13.7	**30.8**	3.26	1.49
Group messaging and chat tools	221	22.2	12.7	22.6	12.7	**29.9**	3.15	1.52
Discussion forums	215	**51.6**	14.9	17.2	7.9	8.4	2.07	1.33
E-mail	224	.4	.4	1.3	**76.3**	21.4	4.18	.51

Table 14

Project implementation – Frequency of use of ICT tools for evaluation planning (C1-2)

Items	N	Response distribution %					Mean	SD
		Never	Rarely	Sometimes	Frequently	Always		
Interactive logic models	174	**48.3**	19.0	14.4	9.8	8.6	2.11	1.34
Project management software	172	**27.3**	14.5	20.9	15.7	21.5	2.9	1.5
System mapping software	163	**49.1**	16.0	16.6	12.9	5.5	2.1	1.29
File sharing databases	184	4.3	4.3	15.8	29.3	**46.2**	4.09	1.09

Table 15

Project implementation – Frequency of use of ICT tools for data collection (C1-3)

Items	N	Response distribution %					Mean	SD
		Never	Rarely	Sometimes	Frequently	Always		
Survey development tools	230	9.6	3.0	13.9	29.1	**44.3**	3.96	1.25
Digital data collection devices	225	19.6	8.4	21.3	20.4	**30.2**	3.33	1.48
Photo/video monitoring	213	**53.1**	16.0	17.4	8.5	5.2	1.97	1.23
Social media	220	**49.1**	19.5	15.0	11.4	5.0	2.04	1.25
Mapping tools	214	**43.5**	17.3	18.2	13.1	7.9	2.25	1.34

Table 16

Project implementation – Frequency of use of ICT tools for data analysis (C1-4)

Items	N	Response distribution %					Mean	SD
		Never	Rarely	Sometimes	Frequently	Always		
Qualitative software	227	20.3	12.8	22.9	19.4	**24.7**	3.15	1.45
Quantitative software	233	4.7	4.7	11.2	27.9	**51.5**	4.17	1.1
Bid Data for analysis	201	**53.7**	14.4	13.4	8.5	10.0	2.06	1.38
Crowdsourcing	191	**79.6**	13.6	3.1	2.6	1.0	1.32	.75

Table 17

Project implementation – Frequency of use of ICT tools for reporting (C1-5)

Items	N	Response distribution %					Mean	SD
		Never	Rarely	Sometimes	Frequently	Always		
Data visualization	208	3.4	3.8	25.0	31.7	**36.1**	3.93	1.03
Digital storytelling	188	**48.9**	11.2	21.3	9.6	9.0	2.19	1.37
Dashboards	194	**30.4**	12.4	22.7	18.6	16.0	2.77	1.46
Social media	190	**48.9**	20.5	13.7	10.0	6.8	2.05	1.28

Use of ICT for reporting received a relatively low average score (see Table 17 above), which is somewhat surprising given that participants noted relatively frequent reliance on ICT for reporting in the first question of the survey. This suggests that projects that the participants were reflecting on in this survey may have differed from their normal practice. The standard deviations for planning and reporting stages in Table 17 were in fact higher than the rest, which suggests a higher variability across participants. Second, there was less variability among responses in the first question than in the follow-up questions, noted by slightly lower standard deviation scores noted in Table 12. In other words, when participants were asked to consider ICT frequency across evaluation phases in a broad sense, their responses were closer to the mean than when they were presented with itemization of ICT tools under each following category. This suggests that different, individualized approaches to applying ICT emerge when we begin to dig deeper. And lastly, the data also revealed that evaluators have a tendency to use more established technologies rather than those that have emerged in recent years. For example, when assessing tools for data analysis, software for quantitative analysis, the use of which is conventional within the field, received an average score of 4.17, or just over 'frequently'. Software for qualitative data analysis received a rating of 3.15, or just over 'sometimes', which is surprising given that the majority of projects discussed were identified to have mixed-methods design elements. What is noteworthy to mention is that the remaining two options, 'big data for analysis' and 'Crowdsourcing' – both rather new developments in the field of program evaluation - received very low scores, just 2.06 and 1.32, respectively. However, it is also important to mention that the standard deviations for these two categories were vastly different, with variability for 'big data' being considerably higher than for 'Crowdsourcing'. This tells us that while means for these categories were quite low, 'pockets' of big data activity may exist.

Overall, however, the tendency to favour established or 'traditional' tools was somewhat replicated in the other sections, such as reporting. In that section, participants indicated high use of data visualization, with an average score of 3.93, but low use of social media and digital storytelling, with scores of 2.05 and 2.19, respectively. However, the standard deviations in this section are higher, suggesting considerable variability among responses. These survey findings suggest that evaluators may be engaging technologies that are more tried and true. While uptake of newer tools in practice is not nonexistent, it remains on the margins at least for the time being. To illustrate this, we can look at the data for all of the tools and isolate those that received a rating over 4, or 'frequently'. Across five categories, only three tools received this rating, and they are: (a) e-mail for communication; (b) software for quantitative data analysis; and (c) file sharing databases for evaluation planning, all with relatively low variability. Among the rest, two additional tools received high averages that were just shy of the 4.0 mark, and these were: (d) survey development tools for data collection, and (e) data visualization for reporting, and these two had relatively low variability. Some of the tools with the lowest averages were: (a) crowdsourcing; (b) photo/video monitoring; (c) social media for data collection; and (d) and big data for analysis. Again, these scores underline that the use of these tools is infrequent, if not altogether rare. This is particularly interesting given that the respondents' self-assessment of ICT use showed the majority as being rather close to 'frequent' ICT users. What these survey data suggest is that the use of mainstream tools, as opposed to those that may be considered more novel, seems to satisfy the needs of evaluation practitioners, and are enough for these respondents to self-identify as ICT users. This somewhat contrasts with Study 1 findings as participants of that study provided in-depth examples of novel applications of ICT. This difference is likely due to sampling, as Study 1 participants were purposely selected based on

their work in this area and for their affinity of using innovative technologies. However, although interview participants explored emergent technologies, the data did show that using ICT in practice was done slowly[32].

In the next section, participants were asked how the use of the ICTs they selected affected the evaluation use (see Table 18 and Table 19 below). The data for both sections suggest that participants lean towards viewing ICTs as more of a positive influence rather than not, with the average scores for both sections falling past the mid-point of the scale (M = 3.81). However, it is interesting to note that the mode for each question in the section was 4, signifying that the majority of participants were still more likely to 'agree' with the statements presented. These data hint that that the 'community', as represented by the cumulative scores of this sample, may be reluctant to *attribute* outright the influence of ICTs on both process and findings use, but recognize that ICTs have a *contributory* role to play in use. While no question from this section received a mean rating lower than 3, or 'neither agree nor disagree', participants' responses achieved a mean rating of 4, or 'agree', for only the following questions: improving communication between stakeholders and evaluator, which had the least variability ; promoting accessibility of evaluation findings, and providing rapid communication of findings. The questions that received the three lowest scores were: helping stakeholders learn about doing evaluation, which had the greatest variability; reducing demands on stakeholders with regards to the evaluation), and; stimulating action within the program.

[32] Other barriers also played a role, as was noted in the 'Barriers to ICT implementation and use in evaluation practice' section of Study 1. Due to these barriers, uptake of new ICTs in practice may be slow.

Table 18

Project implementation – Perceived added value of ICT to evaluation process use (D1)

Items	N	Response distribution %					Mean	SD
		Strongly disagree	Disagree	Neither disagree not agree	Agree	Strongly agree		
Improving communication between stakeholders and evaluator(s)	256	0	3.1	14.8	**53.1**	28.9	4.08	.75
Reducing the demands on stakeholders with regards to the evaluation	255	1.2	11.0	34.9	**36.1**	16.9	3.56	.94
Helping stakeholders learn about doing evaluation	255	2.4	16.1	29.4	**37.3**	14.9	3.46	1.01
Helping stakeholders learn about how evaluation can be used	255	3.1	11.4	25.1	**46.3**	14.1	3.57	.97
Improving internal working processes for the stakeholders	253	1.6	9.9	25.7	**44.7**	18.2	3.68	.94

Table 19

Project implementation – Perceived added value of ICT to evaluation findings use (D2)

Items	N	Response distribution %					Mean	SD
		Strongly disagree	Disagree	Neither disagree not agree	Agree	Strongly agree		
Improving trustworthiness of data	254	1.2	6.7	24.4	**43.3**	24.4	3.83	.92
Offering rapid communication of findings	255	0.0	4.3	12.9	**54.9**	27.8	4.06	.76
Improving accessibility of evaluation findings	255	1.2	2.7	13.7	**51.4**	31.0	4.08	.81
Stimulating discussion about the evaluation findings	255	1.6	8.2	23.1	**45.9**	21.2	3.77	.93
Stimulating action within the program/project	255	2.4	9.4	34.1	**38.0**	16.1	3.56	.95
Reducing evaluation costs	254	1.6	12.2	32.7	**34.6**	18.9	3.57	.98

It is important to note that while variability among these responses was comparatively low, the small spike observed in the standard deviation for the effect of ICT on stakeholders' learning about conducting evaluation – one of the chief aspects of process use – may be less consistent across the responses. Although Study 1 participants noted that ICTs can play a multitude of roles in evaluation, its role may be strongest in supporting background processes, that is, those aspects of evaluation that may not necessarily 'seen' by stakeholders. These contrast with foreground processes, or aspects that are more readily witnessed, such as improving communication. The survey responses seem to reflect those findings. Although we can see that participants noted improved communication as a result of ICTs, there may be an onus on findings use given the emphasis on strengthening findings by improving speed and accessibility. Lower means in questions that addressed 'learning by doing' may also be showcasing preference for findings use over process use. Within the scope of findings use, we can also see a difference between the means measuring instrumental and conceptual use, as participants were more likely to agree that ICTs have a greater effect on stimulating discussion as opposed to concrete action (refer to Table 19). This somewhat aligns with Study 1 findings where interview participants noted the effect of ICTs on sense-making.

This section of the questionnaire was concluded with another opportunity for open-ended input pertaining to ICT use, and in the end drew responses from 27 individuals. Although the responses were not very detailed, an analysis revealed a range of experiences, both positive and negative. Impediments to ICT use were identified, such as communities' limited connectivity, lack of training for evaluators on how to use technological tools, cumbersome data cleaning, and the inability to contextualize findings, which according to the comments, increased the possibility of misuse.

Roles of Actors Involved

Outside of ICT use, participants were also asked a number of questions about team the roles that the evaluator and the project's stakeholders played in the project, as well as questions pertaining to the relationship between these actors. To reiterate a point made earlier in this thesis, these questions were included to reflect the components of the conceptual framework, which illustrated that use emerges not only when the evaluator engages the stakeholders, but when the stakeholder brings with them their own willingness to learn. The evolving relationship between these actors further helps to create the conditions in which evaluation use can flourish. To explore these elements, the survey first posed six of questions to participants regarding their time invested in the process (see Table 20 below), to explore through participants' self-assessment whether evaluation use was a 'passive' trait of their practice. The data collected for these questions revealed that participants perceive their own input into the project to be significant[33]. For example, the scores for the six questions averaged 4.14, or just slightly over 'agree'. The variability across the board was also quite constrained, suggesting that participants were much more likely to agree with the statements. We can see that the scores for understanding stakeholder needs and for building a working relationship with stakeholders received the highest scores. The question to receive the lowest score concerned evaluation capacity building within the client organization, and this had the highest variability across the items.

[33] As this survey instrument was initially intended to collect data from yoked pairs of practitioners and stakeholders, this may have played a part in the high means for questions in this section. This will be revisited in the Limitations section below.

Table 20

Project implementation – Evaluator's involvement (E1)

Items	N	Response distribution %					Mean	SD
		Never	Rarely	Sometimes	Frequently	Always		
Building a working relationship with the stakeholders	252	.4	1.2	11.9	37.7	**48.8**	4.33	.76
Understanding stakeholders' needs	252	.4	.8	7.5	34.9	**56.3**	4.46	.71
Involving stakeholders throughout the evaluation process	250	.4	2.8	14.8	39.2	**42.8**	4.21	.83
Making the evaluation process engaging for stakeholders	252	1.2	5.2	23.8	**36.1**	33.7	3.96	.94
Discussing with stakeholders how the evaluation results might be used	252	.4	5.6	15.5	35.3	**43.3**	4.15	.91
Promoting evaluation culture within the stakeholder organization	250	4.8	10.0	24.4	**30.8**	30.0	3.71	1.14

Evaluation capacity building has been an area of ongoing area of interest within the community, but much like evaluation use, capacity building is multi-faceted and likely beyond the scope of most projects, which might also explain the observed spike of variability. In comparison, most Study 1 participants also identified the importance of context, noting that unforeseen difficulties can sometimes obscure evaluation use and similarly hinder capacity building. This may explain why even despite the overall high averages for all six questions, we can see a slight disparity emerge here.

When asked how often the evaluators had followed up in the project – once, several times, or not at all - the majority of participants once again reported a high rate of follow-up. The average score of 2.41 suggests that the majority of participants followed up at least once or several times (see Figure 9). This somewhat contrasts with Study 1 findings where only a small number of participants spoke about using follow-ups as a strategy for use, whereas survey participants' responses point to it more heavily.

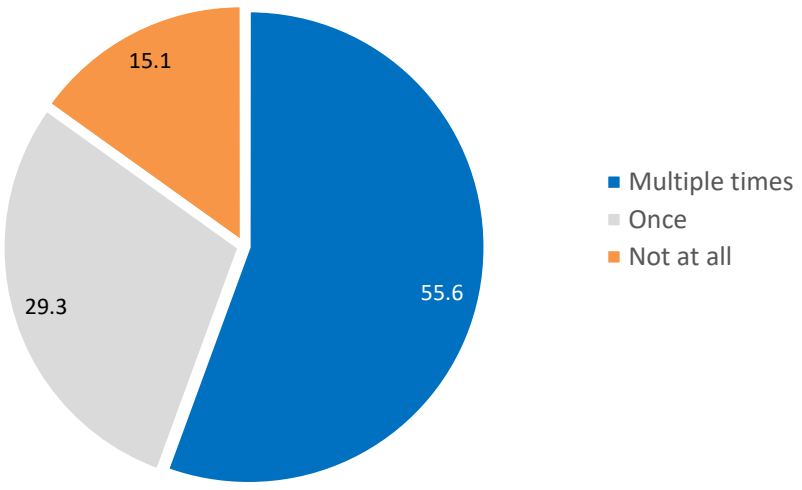

Figure 9: Project implementation – Follow-ups (E2) (n=239)

Participants were once again invited to add any other details concerning their role as the evaluator in the form of an open-ended question, generating responses from 58 participants. These submissions, once coded, revealed a number of very different style of responses. First, 18 of the comments self-identified participants to be leaders, facilitators and mediators, whereas only 3 comments noted an exclusive focus on the role of stakeholder training. Participants again noted the external influences that hampered the evaluation project, such as interpersonal and organizational dynamics. ICT challenges (such as lack of access, connectivity, client apprehension, vastness of data, and technology leading to scope creep) were also noted. In a small number of comments, participants expressed that these challenges compelled them to rethink their approach and lessen dependence on technology where necessary. While lacking the richness of a qualitative method like an interview, these comments still reflect Study 1 data, which too revealed a number of barriers, failures, and re-conceptualizations concerning what role ICT is meant to play in evaluation.

The subsequent section pertained to who was involved in the project, and explored these stakeholders' level of comfort and familiarity with evaluation, as well as their overall willingness to engage. Participants were asked to identify how often or rarely the various groups of stakeholders were involved, choosing from a 'scale' that is quite typical for program evaluation, that is, ranging from program sponsors and funders, to members of special interest groups and intended program beneficiaries. Primary stakeholders are ideally those individuals that will use findings. This is oftentimes the evaluation sponsor, that is, the party that formally hired the evaluator (Rossi, Lipsey, & Freeman, 2004). The survey data for this section is displayed in Table 21 below.

Table 21

Project implementation – Stakeholder involvement (F1)

Items	N	Response distribution %					Mean	SD
		Never	Rarely	Sometimes	Frequently	Always		
Program funders/sponsors	246	17.1	12.6	22.4	22.8	**25.2**	3.26	1.41
Program developers	245	9.0	4.9	16.7	**36.7**	32.7	3.79	1.21
Program managers	245	2.4	2.0	6.9	41.6	**46.9**	4.29	.87
Program implementers/staff/frontline workers	247	1.6	3.6	20.2	**39.3**	35.2	4.03	.92
Intended program beneficiaries/recipients	246	8.9	15.0	**29.3**	26.4	20.3	3.34	1.21
Members of special interest groups	241	**33.6**	15.4	25.3	15.4	10.4	2.54	1.36

These data revealed that program managers were found to be the most commonly involved groups of stakeholders, followed by program frontline workers. This is not surprising as these are groups that most commonly collaborate with evaluators, and ideally, use evaluation results to make changes to the program. Program developers were the next most likely group to be involved. Although there is sometimes overlap between developers and managers and implementers, program developers typically have the unique task of designing program elements, including program planning. It is thus curious that their involvement was not more prominently identified by participants. The data show that the groups that normally remain on the margins of the evaluation process, such as special interest groups and program sponsors were identified as those least involved. Lastly, intended program beneficiaries, that is, stakeholders whose needs the program is meant to address, were also shown to be only somewhat involved.

When juxtaposed with data from the next section addressing stakeholders' familiarity with evaluation (see Figure 10 below), an interesting pattern begins to emerge. What these data show is that program sponsors were the most familiar with evaluation, and were the only group of those included to know 'a great deal' about evaluation, despite being only somewhat involved in the process. It is possible that these program sponsors were also simultaneously the evaluation sponsors, which is curious as evaluation funders are commonly demarcated to be the primary evaluation user and thus are encouraged to be highly involved. In contrast with this group, the remainder of stakeholders were mostly 'Somewhat' familiar with evaluation. Program developers, who were also not regularly involved, were the next group with the highest average score in familiarity.

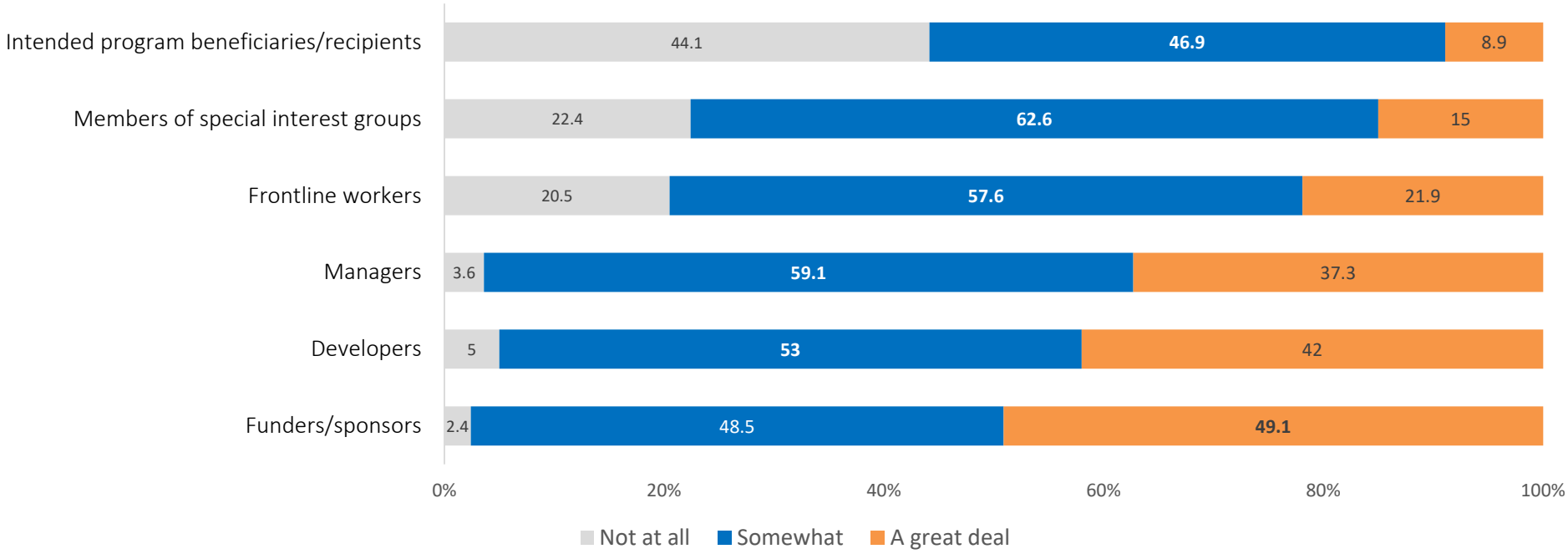

Figure 10: Stakeholders' familiarity with evaluation (F2)

As compared to this, managers and frontline workers, the two groups of participants noted to be the most involved groups, were overwhelmingly noted to be only 'Somewhat' familiar, with scores of 2.34 and 2.01, respectively, and with frontline workers being more likely than managers to be 'not at all' familiar with evaluation. Lastly, the groups identified to be the least familiar, perhaps unsurprisingly, were intended program beneficiaries and recipients of the program, who were most commonly categorized as being 'not at all' familiar, and members of special interest groups. This is in line with Study 1 findings where interviewees spoke about stakeholders' lack of familiarity with evaluation, which then created a need for easing the process as much as possible.

In the next section, participants were asked to discuss stakeholders' overall readiness to engage in the evaluation (see Table 22 below). This was included in the survey in order to gauge if stakeholders' 'willingness to learn' – a component as discussed in the conceptual framework - was present in these projects. The data show that of these four categories, participants perceived stakeholders' interest in developing evaluation skills to be displayed the least, with the average score of 2.84, which is somewhere between 'rarely' and 'sometimes'. In contrast, interest in evaluation results achieved the highest average score 4.26, or nearly 'always'. Actual perceived use of evaluation findings averaged 3.77, which tells us that participants saw actual evaluation use occur within the project, and that this was, on average, a near 'frequent' occurrence. Overall levels of engagement of stakeholders received the score of 3.7, that is, also leaning towards 'frequent' involvement though not quite reaching that average score. Altogether, these data suggest an interesting dynamic taking place in these projects.

Table 22

Project implementation – Stakeholders' interest in evaluation (F3)

Items	N	Response distribution %					Mean	SD
		Never	Rarely	Sometimes	Frequently	Always		
Interested in learning about developing evaluation skills	237	11.0	21.9	**45.6**	15.6	5.9	2.84	1.01
Engaged throughout the evaluation process	243	0.0	6.6	32.9	**44.0**	16.5	3.7	.82
Interested in the evaluation results	242	0.0	1.7	13.2	42.1	**43.0**	4.26	.75
Used the evaluation results to improve the program/project	225	.9	6.2	31.6	**37.3**	24.0	3.77	.92

For example, we see that stakeholders are involved, but may be more interested in using the findings rather than learning how to conduct evaluations. In other words, findings use may be being prioritized in these types of projects over process use. If learning how to conduct evaluations was not an apparent focus and yet participants still saw evidence of actual evaluation use, this may further imply a focus on use of findings.

The last section of the survey addressed the relationship component between stakeholders and evaluation practitioners. Recall that this element was also derived from the conceptual framework, therefore gaining insight into the role of relationships was an important motivation for its inclusion. The data from this section indicate that participants positively view the quality of relationships that unfolded within the projects. Table 23 below displays the data that were collected. All seven questions yielded an average score of 4.07, and all but one question yielded an individual average score over 4, or 'agree', implying that the majority of practitioners viewed these relationships as quite healthy. Only when asked about whether the team shared decision making did the average score fall to 3.89. The relatively low standard deviation scores also signify that variability among responses was constrained.

Table 23

Project implementation – Relationship between the evaluator and stakeholders (F4)

Items	N	Response distribution %					Mean	SD
		Strongly disagree	Disagree	Neither disagree not agree	Agree	Strongly agree		
Had a clear understanding of roles and responsibilities concerning this evaluation	241	.8	4.6	12.9	**52.3**	29.5	4.05	.83
Worked towards a common goal	241	.4	5.0	10.4	**48.5**	35.7	4.14	.83
Communicated frequently throughout the evaluation process	241	.4	4.1	8.7	**49.0**	37.8	4.20	.8
Shared decision making throughout the evaluation process	238	1.7	9.2	15.5	**45.8**	27.7	3.89	.97
Were open to new ideas	241	.8	5.4	13.7	**50.2**	29.9	4.03	.85
Acknowledged any conflicts as they arose	223	.4	4.0	18.4	**48.9**	28.3	4.0	.82
Developed mutual trust	241	.8	4.6	8.7	**48.5**	37.3	4.17	.83

Explaining Process and Findings Use

A number of correlation analyses were conducted in order to determine the extent to which use of ICTs explains variation in process and findings use. First, I created scale variables associated with constructs in the conceptual framework; survey questions were already conceptually categorized according to such constructs. Table 24 details how eight scale variables were created. The Cronbach's alpha value for all variables was sufficiently high, telling us that there is adequate internal consistency among the scaled items to warrant further analysis. Coefficients of variation calculated on the basis of mean and standard deviation scores also fell at least within the acceptable range[34], between 0.16 and 0.25, suggesting that the data points were closer to the mean. This suggests that variability among participants' answers was not high.

[34] Coefficients of variation less than < 0.3 are associated with less variability (Taylor, Payton, & Raun, 1999).

Table 24

Variable Construction and Descriptive Statistics

Variable	Description	Alpha	Mean	SD	N
1. **Level of ICT use in general evaluation practice** as measured by frequency of use	Linear combination (average) of 6 items rated on a 5 point frequency (never-always) scale: ▪ Communicating with stakeholders (e.g., video conferencing, interactive whiteboard, team collaboration outlets) ▪ Planning (e.g., interactive logic models, project management software) ▪ Data collection (e.g., mobile phones, social media, photo/video monitoring) ▪ Data analysis (e.g., system mapping, big data, qualitative or quantitative analysis software) ▪ Reporting (e.g., data visualization, digital storytelling) ▪ Overall, how often do you rely on technology in your evaluation practice?	0.81	3.55	0.81	328
2. **General perceived value of ICTs** in evaluation practice	Linear combination (average) of 5 items rated on a 5 point frequency (never-always) scale: ▪ ICT helps to reduce evaluation costs ▪ ICT helps to improve the quality of evaluation findings ▪ ICT enhances stakeholder engagement ▪ ICT adds value to my evaluation practice ▪ I try to incorporate new technologies in my evaluation practice	0.81	3.59	0.66	331
3. **Frequency of ICT use** in the project discussed	Linear combination (average) of 5 items rated on a 5 point frequency (never-always) scale: ▪ Communicating with stakeholders (e.g., video conferencing, interactive whiteboard, team collaboration outlets) ▪ Planning (e.g., interactive logic models, project management software) ▪ Data collection (e.g., mobile phones, social media, photo/video monitoring)	0.72	3.68	0.78	268

Variable	Description	Alpha	Mean	SD	N
	▪ Data analysis (e.g., system mapping, big data, qualitative or quantitative analysis software) ▪ Reporting (e.g., data visualization, digital storytelling)				
4. Evaluator's self-assessed strategies for enabling **promotive interaction**	Linear combination (average) of 6 items rated on a 5 point frequency (never-always) scale: ▪ Building a working relationship with the stakeholders ▪ Understanding stakeholders' needs ▪ Involving stakeholders throughout the evaluation process ▪ Making the evaluation process engaging for stakeholders ▪ Discussing with stakeholders how the evaluation results might be used ▪ Promoting evaluation culture within the stakeholders organization	0.88	4.15	0.7	249
5. **Stakeholders' involvement** in the process as perceived by the evaluator	Linear combination (average) of 3 items rated on a 5 point frequency (never-always) scale: ▪ Engaged throughout the evaluation process ▪ Interested in the evaluation results ▪ Used the evaluation results to improve the program/project	0.70	3.92	0.66	225
6. Perceived **quality of the relationship** between the evaluator and the stakeholders as estimated by the evaluator	Linear combination (average) of 7 items rated on a 5 point agreement (strongly disagree-strongly agree) scale: ▪ Had a clear understanding of roles and responsibilities concerning this evaluation ▪ Worked towards a common goal ▪ Communicated frequently throughout the evaluation process ▪ Shared decision making throughout the evaluation process	0.89	4.07	0.66	220

Variable	Description	Alpha	Mean	SD	N
	▪ Were open to new ideas ▪ Acknowledged any conflicts as they arose ▪ Developed mutual trust				
7. The effect of ICT on **process use** as estimated by evaluator's perceived value of these tools in the project discussed	Linear combination (average) of 5 items rated on a 5 point agreement (strongly disagree-strongly agree) scale: ▪ Improving communication between stakeholders and evaluator(s) ▪ Reducing the demands on stakeholders with regards to the evaluation ▪ Helping stakeholders learn about doing evaluation ▪ Helping stakeholders learn about how evaluation can be used ▪ Improving internal working processes for the stakeholders	0.79	3.67	0.68	253
8. The effect of ICT on **findings use** as estimated by evaluator's perceived value of these tools in the project discussed	Linear combination (average) of 6 items rated on a 5 point agreement (strongly disagree-strongly agree) scale: These included: ▪ Improving trustworthiness of data ▪ Offering rapid communication of findings ▪ Improving accessibility of evaluation findings ▪ Stimulating discussion about the evaluation findings ▪ Stimulating action within the program/project ▪ Reducing evaluation costs	0.76	3.81	0.6	252

Descriptions of scale variables.

This section offers descriptions of the eight scale variables listed above, including the variables of *process use* and *findings use* that will serve as criterion variables for subsequent analyses.

Participants' level of ICT use in their evaluation practice.

The first scaled variable measured participants' general attitude towards ICT by averaging 6 items on a 5-point frequency scale. The items included ICT tools categorized by evaluation stages, with the exception of the last item that asked participants how often they rely on ICTs in their general practice as this question pertained to frequency of use rather than its perceived value. This variable obtained a moderate reliability score of 0.81, therefore displaying a moderate internal consistency. The mean score also displayed that the participants who answered the questionnaire are moderate users of ICT.

The perceived value of ICT tools in their practice.

This scaled variable was composed of 5 items on a 5-point frequency scale that measured the overall value of ICT in participants' practice. A relatively high reliability score of 0.81 signifies that the items are internally consistent and that no items needed to be excluded. Overall, participants' cumulative mean scores lean towards the more positive end of the spectrum, demonstrating that participants see ICT having some value for practice.

Frequency of ICT use in the project discussed.

An average of 5 items on a 5-point frequency scale were combined to measure the incidence of ICT use in the chosen project. The Cronbach's α of 0.72 fell within acceptable parameters for reliability. The mean scores suggest that ICTs were moderately, though not excessively, used throughout the projects.

Evaluators' facilitation.

A combination of 6 items on a 5-point frequency scale was used to measure evaluator's facilitation of promotive interaction within the project. This scale variable displayed a high reliability with a score of 0.88, and had a considerably high mean of due to high averages of its root items. This suggests that participants perceived their facilitation to be more than satisfactory.

Stakeholders' involvement in the process as estimated by the evaluator.

This scaled variable was constructed as an average of 3 items on a 5-point frequency scale, and met the Cronbach's α threshold with a score of 0.7. The average mean was lower than that of evaluators' facilitation but was nonetheless relatively high, suggesting that participants perceived stakeholders as being engaged.

Perceived relationship quality between evaluators and stakeholders.

To measure perceived quality of relationship among the evaluation team, a scaled variable was constructed from 7 items on a 5-point agreement scale, and received the highest

score for reliability, 0.89. The similarly high mean for the variable implies that participants saw their relationships with stakeholders to be very positive.

Perceived effect of ICT on process use (criterion).

Two criterion scale variables were constructed. The first variable measuring process use was created from 5 items on a 5-point agreement scale, and had an internally reliable score of 0.79. The means suggest that participants saw ICT making a modestly positive contribution to process use.

Perceived effect of ICT on findings use (criterion).

The second criterion scale variable was constructed to measure findings use, using 6 items on 5-point agreement scale. This scale variable had a 0.76 score for internal consistency, however the means were higher than that for the variable measuring process use. This suggests that the perceived effect of ICT on findings use is more easily perceived by participants.

Summary.

We can observe from the standard deviation scores for all scaled variables that variability among participants' responses was not high, suggesting that participants' most responses were fairly close to the mean. Glancing at the average scores for each variable, we can also see that the highest means relate to the evaluators' self-assessed strategies for promotive interaction, and the perceived quality of the relationship between the evaluator and the stakeholders. The average for the scaled variable measuring stakeholders' commitment to learning received a slightly lower mean, but nonetheless one that suggests that stakeholders were close to being 'frequently'

engaged. Since these values are largely based on self-assessment, it is possible that this positive interpretation is linked to the limitations of this study. At face value, however, it tells us that the three foundational blocks I identified in the conceptual framework to be critical for evaluation use – evaluator's role in promotive interaction, stakeholders' willingness, and the relationships between these two groups of actors – were identified by stakeholders as being present in the projects they described.

Interrelationships among scale variables.

As noted earlier, since the major focus of this research was to identify how ICTs explain process use and findings use, these two scale variables were isolated as the criterion variables for further statistical analysis. Process use included items most closely related to the evaluation process and the learning accrued during that time. Findings use incorporated items related to the production of findings and the specialized learning that may have occurred as a result of these findings. The remainder of the scale variables were identified as predictor variables. A zero-order intercorrelation matrix was generated in SPSS to analyze the relationship among the variables (see Table 25). First, this table illustrates that the criterion variables had a positive, albeit a moderate, relationship with one another, indicating that they measured different constructs of ICTs effect on evaluation use. Secondly, we can see that nearly all predictors correlated positively with the criterion variables in the expected direction[35].

[35] A ninth scaled variable measuring stakeholders' familiarity with evaluation was omitted from analyses due to a considerably lower n-size.

Table 25

Intercorrelations among criterion and predictor variables. (Pairwise deletion of missing data: N = 215-331)

	1	2	3	4	5	6	7	8
Criterion Variables: *Effect of ICT on Evaluation Use*								
1. Perceived effect of ICT on process use in evaluation	1.0							
2. Perceived effect of ICT on findings use in evaluation	.678**	1.0						
Predictor Variables: *Factors influencing effect of ICTs on evaluation use*								
3. Level of ICT use in general evaluation practice	.433**	.389**	1.0					
4. Perceived value of ICTs in evaluation practice	.481**	.543**	.675**	1.0				
5. Frequency of ICT use in the project discussed	.492**	.468**	.719**	.628**	1.0			
6. Evaluator's self-assessed promotive interaction	.431**	.354**	.274**	.313**	.328**	1.0		
7. Stakeholders' involvement in the process as estimated by the evaluator	.238**	.301**	.202*	.217**	.326**	.440**	1.0	
8. Perceived quality of the relationship between the evaluator and the stakeholders as estimated by the evaluator	.374**	.385**	.244**	.285**	.325**	.520**	.668**	1.0

* p<.01 **p<.001

It should be noted that the low values for the other predictor variables indicate that, on the whole, these relationships were statistically weak. Lastly, the table shows us that among the predictor variables, there were several low and one moderate correlation (.72), which indicates a possible multicollinearity among the predictors[36]. However, as this was an instance in only one case and the value was less than .80[37], it is likely that ensuing regression analysis would not be affected with instability.

Explaining Evaluation use

Stepwise multiple regression of the data was performed to assess the extent to which the predictor variables explained variation in the criterion variables associated with evaluation use (see Table 26). As seen in the table, regression models were run in SPSS for each of the two criterion variables. The first analysis on process use yielded a statistically significant model with three predictors. This model explained an impressive 39% of the variation in the criterion, (R^2=.39, F (3,202) = 42.3, p= .0). The three predictors were: perceived value of ICTs in evaluation practice; evaluators' self-assessment of promotive interaction, and; the intensity of ICT use in the project specified.

[36] Multicollinearity describes a state where there is a statistical similarity among explanatory variables (Hutcheson & Sofroniou, 1999). In the case where the scores are sufficiently high, a regression analysis can be adversely affected (Hutcheson & Sofroniou, 1999). As these data were collected from the same participants using only one instrument, moderate correlation between the predictor variables may be the result of this limitation.
[37] Although the threshold for multicollinearity ranges across the disciplines, 0.8 is generally considered acceptable (Gujarati & Porter, 2009).

Table 26

Explaining Variation in Evaluation Use Using Stepwise Multiple Regression[38]

Criterion Variable	R^2	Predictor	Step	ß	t
1. Perceived effect of ICT on process use in evaluation	.39	4. Perceived value of ICT in evaluation practice	1	.3	4.24
		6. Evaluators' self-assessed promotive interaction	2	.28	4.74
		5. Frequency of use of ICT in the project discussed	3	.22	3.04
2. Perceived effect of ICT on findings use in evaluation	.4	4. Perceived value of ICT in evaluation practice	1	.48	8.07
		6. Evaluators' self-assessed promotive interaction	2	.17	2.55
		8. Perceived quality of the relationship between the evaluator and the stakeholders, as estimated by the evaluator	3	.15	2.28

[38] Predictors are numbered according to the same order they appear in Table 25.

These findings are fascinating as this tells us that evaluators who have already thought that ICT is useful prior to the project also saw these tools being beneficial for process use. It also tells us, perhaps unsurprisingly, that if participants saw themselves as agents dedicated to stakeholders' engagement and learning, the more likely they were to perceive process-based learning as a result of ICT taking place. Lastly, the data suggest that if ICT was more heavily used in the project, then its effect on process use was also more likely to be perceived by participants.

The second analysis examined the effect of ICT on findings use, and generated a final model with three statistically significant predictors, explaining 40% of variation, (R^2=.4, $F(3,200) = 44.07$, p =.0). Two of these predictors overlapped with the previous analysis. That is, general perceived value of ICTs in evaluation practice predicted whether or not participants also thought these tools led to findings use, as did evaluators' self-assessment of promotive interaction. In this model, perceived quality of the relationship between the evaluator and the stakeholders as estimated by the evaluator was also found to predict variation in findings use. Similar to the previous analysis, what these findings suggest is that if participants already value ICT in their general practice, they are likely to link ICTs to use of findings. Likewise, if they perceive themselves to be going above and beyond to promote learning, they are likely to perceive an occurrence of findings use as a result of ICT. One distinguishing factor in this analysis is the quality of the relationship among evaluation team. The data tell us that positive relationships allow participants to consider ICT as being helpful to findings use.

Relationships between Actors

Given that relationships is a key piece of the conceptual framework, and has continued to surface as an important factor in evaluation use, I ran an additional stepwise multiple regression analysis to assess the extent to which relationships were affected by other factors (see Table 27). As well as using the predictor variables listed above, I also incorporated the data for evaluator age and years of experience in the field. The analysis generated a statistically significant model with two predictors that accounted for 51% of the variation in the variable measuring evaluator-stakeholder relationships (R^2=.51, *F* (2, 202) = 105.94, p= .0). The two predictors were stakeholders' involvement in the process (as estimated by the evaluator), and evaluators' self-assessment of promotive interaction. These two predictors were also components of the conceptual framework that were theorized, along with contextual factors, to influence relationships among evaluation team members. The remainder of the variables, including age and years of experience, were excluded by the model, signifying that these variables are not statistically significant in explaining relationship quality. What this tells us is that relationships between evaluators and stakeholders thrive when both parties are sufficiently dedicated to the process. It also suggests that there is an interconnection among the factors influencing use, and particularly findings use, as the regression model discussed above identified relationships as a predictor variable. In other words, we can see that the connection of ICT to use of findings use may be reliant on a pyramid of other factors that work in cohesion.

Table 27

Explaining Variation in Relationships Using Stepwise Multiple Regression[39]

Criterion Variable	R^2	Predictor	Step	ß	t
1. Perceived quality of the relationship between the evaluator and the stakeholders as estimated by the evaluator	.51	7. Stakeholders' involvement in the process as estimated by the evaluator	1	.55	9.8
		6. Evaluators' self-assessed promotive interaction	2	.26	4.63

[39] Predictors are numbered according to the same order they appear in Table 25.

Summary.

In this chapter, I presented and discussed the findings from Study 2, the quantitative component of my two-part explorative sequential design. The principal purpose of Study 2 was to gather and analyze data to help gauge the generalizability of findings gathered thus far, and identify where discrepancies may lie. The analysis of the survey data reveal that the findings of the qualitative and quantitative components generally concurred.

The survey responses show that participants moderately rely on ICT and appear to strive to include these tools in their practice. There is a noticeable preference for tools used for data analysis and reporting, and a disinclination toward tools used for evaluation planning, as was noted in Study 1. The benefits of ICT most noted by participants was improving the quality of evaluation findings; other benefits of reducing costs and improving stakeholder engagement were noted to a lesser degree.

Regarding project characteristics, the data reveal that projects were mostly large scale, and utilized mixed-method methodologies. Although summative evaluation was the most commonly selected option of the three options provided, the two learning-focused evaluation types, combined, made up the majority. Subsequent analysis of open-ended question data demonstrated a number of challenges being confronted, such as large, unmanageable project scope, institutional constraints, lack access to participants, technological hurdles, and poor interpersonal dynamics between the evaluator and the stakeholders.

Data on ICT use within the evaluation project show that ICT was used in different ways, but predominantly for data collection and analysis. Responses also revealed that evaluators are inclined towards using established technologies, whereas use of ‘emergent’ tools such as ‘big data’ analytics, were considerably less prominent. This may be signalling that ICT use in

evaluation advances at a cautious pace. Further reinforcing Study 1, survey results indicate that ICTs facilitate promotive interaction in subtle yet nonetheless valuable ways. However, the data point to a stronger connection to findings use, and especially conceptual use, as opposed to learning effects arising from proximity to the evaluation process, or process use. This was further displayed in the section concerning roles of actors involved where stakeholders' readiness to learn and develop evaluation skills was rated lower than their readiness to act on or learn from findings arising from the evaluation. This is particularly interesting given that majority of projects could be classified as having a learning focus. Despite the responses showing stakeholders having only a subtle interest in capacity building, participants noted that stakeholders used the evaluation result to make improvements to the program, which may further suggest that findings use was more prevalent in these projects.

Regarding evaluator roles, average scores were relatively high, signifying that most participants viewed their facilitation of the process in a positive light. This was similarly the case concerning data on relationship quality between evaluators and stakeholders. In fact, the scale variables measuring these two concepts – evaluators' facilitation of promotive interaction and relationships – also yielded the highest means among the indicators I examined. Given that practitioners appear highly regard interpersonal dynamics highly, this might further explain the low reliance on ICT for introductory stage of evaluation.

Lastly, I used stepwise multiple regression to assess if variation in evaluation use could be explained by six predictor variables. These were: (1) level of ICT use in general evaluation practice; (2) perceived value of ICTs in evaluation practice; (3) frequency of ICT use in the project discussed; (4) evaluator's self-assessed promotive interaction; (5) stakeholders' involvement in the process, as estimated by the evaluator; and (6) perceived relationship quality

between the evaluator and the stakeholders. For process use, the final model included three predictors: perceived value of ICTs in evaluation practice; evaluators' self-assessed promotive interaction, and; the intensity of ICT use in the project specified, accounting for 39% of variation in process use. Similarly, about 40% of variation in findings use was explained by three predictors, two of them overlapping with the process use model. The three predictors were: perceived value of ICTs in evaluation practice; evaluators' self-assessed promotive interaction, and; perceived relationship quality between the evaluator and the stakeholders. Cumulatively, these findings suggest that evaluators who already value ICT may be more likely to remark on its benefit to enhancing evaluation use. Evaluators who dynamically focus on engaging their stakeholders may also see ICT as providing leverage to enhance evaluation use. Finally, we can derive from these models that higher use of ICTs in projects can support process use, whereas better relationship quality is reported to have a marginally greater effect on findings use. Given the continued importance of the variable measuring relationships, a third stepwise multiple regression was conducted to determine how well this variable was explained by other factors. These included all of the predictor variables, as well as additional variables of evaluator age and years of experience. This analysis yielded a final model with two predictors that together measured 51% of the variation in relationships - stakeholders' involvement and evaluators' facilitation of promotive interaction. This suggests that relationships, as may be expected, are the sum of effort from the parties involved.

The alignments across both studies contributed to a more wholesome understanding of ICT use in evaluation practice, and were used to inform the final version of the conceptual framework, which will be presented in the next Chapter.

Chapter 6: Discussion and Conclusion

This chapter presents the summary of findings from Studies 1 and 2, and discusses how these findings help to address existing gaps in the academic knowledge base. The chapter also discusses limitations of both studies, and considers implications for ongoing practice and future research.

Review of Findings

Through an exploratory sequential design, the two studies comprising this thesis served as two unique and statistically independent lines of inquiry for answering the three research questions. Study 1 provided the opportunity for in-depth examination of ICT use in evaluation practice while Study 2 helped to confirm some of these emerging themes and test their generalizability. Below I summarize key findings emerging from these interconnected studies.

Integrated summary response to research questions.

The purpose of this thesis was to answer five research questions that focused on understanding the role of ICT in evaluation practice. The two studies succeeded in answering four of the research questions, and produced findings that will sharpen our understanding of how ICT and evaluation practice presently intersect, adding value to this poorly understood topic. It bears saying that answers to the fifth research question – convergence of evaluator and stakeholder perspectives – were not forthcoming given emergent difficulties in accessing stakeholder participants; this I discuss in the more detail in the Limitations section below. The following discussion frames the findings as answers to the four research questions.

1. The first research question enquired how ICTs influence **promotive interaction and group interplay** within the evaluation process. The final analysis from both studies suggests that ICTs play a contributory role by enabling the evaluator to meet stakeholder needs. For example, survey data regarding project characteristics demonstrated that stakeholders were more interested in using evaluation results and use these for stimulating discussion rather than to develop evaluation capacity. This was the case despite the high scores of involvement of stakeholders, especially program managers and frontline staff, within the projects. Therefore, we can presuppose that the role of ICT tools may be greatest for improving evaluation 'products' from which a form of stakeholder learning stems, at the very least within the contexts of the projects discussed. Furthermore, interview participants identified a number of strategies that can be used to facilitate promotive interaction. These were found to be underpinned both by context and relationships, and included stakeholder involvement, strategic communication, follow-ups, and resource management. The role of ICTs, as they explained, in turn was to support these human-centered and needs-based strategies.

2. Closely related to Question 1, the second research question sought to answer how ICTs **influence learning** (process use), and the **use of evaluation findings**. The final analyses confirm that ICT influences process use by supporting background and, to a lesser extent, foreground evaluation processes. This means that although stakeholders may not 'see' ICT directly, they may benefit from its influence. Concerning background processes, ICT can improve how evaluation is executed. It does so by improving speed, accuracy, and quality for findings production. On the other hand, ICT can affect foreground processes to a lesser extent by enabling communication and aiding in sense-making within the evaluation team. As such, it seems that evaluation stands to gain the most from ICT when these tools are used for improving

evaluation *products* as opposed to *processes*, since the latter rely heavily on interpersonal dynamics. While ICT can certainly support these existing dynamics, it cannot artificially shape them. In this sense, we can conclude that ICT does not influence process use as much as findings use. Two models were developed using stepwise multiple regression to identify what predictors help explain the role of ICT in these two forms of use. Three predictors were generated, two of which were the same for both models - perceived value of ICTs, and promotive interaction. These two predictors tell us that evaluators who attempt to engage stakeholders and who feel confident in the value of ICT – perhaps from experience and active dabbling with technology - may more easily recognize its added value for use. The third predictor was different for each type of use. For process use, the predictor of ICT use in the project played a more prominent role. Since 'learning by doing' essential to process use occurs when participants are more involved in evaluation activities, participants would have greater exposure to ICT if these tools were used in hands-on manner; although the survey suggests that this may not currently be the norm in practice. In contrast, the last predictor for findings use was relationship quality. This tells us that ICT can be helpful for generating findings in conjunction with interpersonal dynamics within the team, which may lend an interpretive function to the technology used.

3. This research question asked which **situations/evaluation contexts** may or may not be **most appropriate for ICT use in evaluation**. The studies suggest that that ICT can be used in a variety of projects. While the majority of projects discussed by the survey were identified as being learning-oriented, utilizing mixed-methods methodology, and were typically large scale, the data demonstrate that ICTs are being used across different contexts. In fact, the central theme to emerge from both the quantitative data and the qualitative input is that projects are characterized by complexity and multiplicity. This suggests a number of challenges common to

evaluation such as scope creep, budgetary constraints, and challenges with respect to communication with stakeholders. Hurdles unique to ICT use were also noted, including stakeholder hostility towards ICT, and lack of access to newer technology for evaluators. These findings suggest that ICT use should be assessed for its potential benefits and drawbacks, and tailored to the context. Rather than relying on the same tools over and over, interview participants noted how important it is to ensure that implementation of any technology is not done with a 'cookie-cutter' approach, emphasizing that ICT tools should be chosen when their use meets the ethical requirements of evaluation practice, and most importantly, reflects a specified need. Also important are the financial and skill-oriented capacities for ICT use. In other words, since implementation of any technology can be costly, this is something that should be considered beforehand. The evaluator must also be comfortable enough with and trustful of the tools, while stakeholders should show interest in ICTs and not exhibit apprehension towards its use. In some ways, this parallels with the elements that affect evaluation use as a whole, in that the context, the evaluator, and stakeholders all have roles to play to ensure that the process implementation does not go awry.

4. The last research question focused on developing a conceptual framework of how ICT contributes to evaluation use. Having conducted these analyses, I used the findings to formulate the final iteration of the conceptual framework (see Figure 11). This framework continues to draw on social interdependence theory and scholarship on evaluation use (i.e. stakeholder and evaluator roles, and the importance of context). The idea of the evaluator as a facilitator of promotive interaction and the stakeholder as a participant exuding a willingness to learn was influenced by my literature review, and hence these two elements were embedded in the conceptual framework at the outset of the research process. The research confirmed their

importance, but also pointed to the greater role of context and relationships. Whereas context acts as an initial antecedent, relationships between the actors can also be understood as an enabler of promotive interaction. I depicted these dynamics as a circular set of arrows between relationship-building and promotive interaction. In other words, as practitioners navigate the context of the project on the left, they also simultaneously work to establish what promotive interaction approach best corresponds to that context, and from there, how best to include ICTs into that approach. The process is iterative and facilitative, as the arrows also indicate, whereby promotive interaction and relationship-building components are engaged in a constant cycle that further informs what works and what should be changed.

The revised framework also draws attention to new elements and processes that were not obvious at the time of the framework's inception, but that emerged through empirical enquiry. These elements pertain to how ICTs support the overall use-focused approach to evaluation, and what barriers and facilitators mediate ICT use. In this way, the final framework contains new theoretical components that may have existed 'between the lines' of the original conceptual framework. In other words, while the original framework posed that ICT can play a supporting role in achieving evaluation use, the revised framework explicates this connection by showing if and how this may occur.

The framework depicts its contributory role to use as a gray space near promotive interaction. This separation of the two elements designates ICTs as one that is contributory, but not essential. Its contributions are in supporting background and foreground processes which closely relate to the strategies listed within the promotive interaction circle. Challenges, drivers and facilitators of ICT use are also depicted within the centre of the gray space, signifying that their presence can influence the degree to which ICT performs its contributory role. For

example, the findings revealed that a balance must be struck between promotive interaction facilitating stakeholder needs and ICT processes, as certain barriers sometimes meant that technology use was reconsidered and, in some cases, abandoned entirely by evaluators. This was especially the case for planning stages of evaluation where interpersonal dynamics took the front seat and helped surface stakeholder needs. In that sense, ICT implementation is vulnerable to its own contextual factors, depicted as a horizontal bar below the gray space. Finally, the path to evaluation use – use of findings and process use - is depicted by a yellow line that travels from the actors through the moving cycle of relationships and promotive interaction.

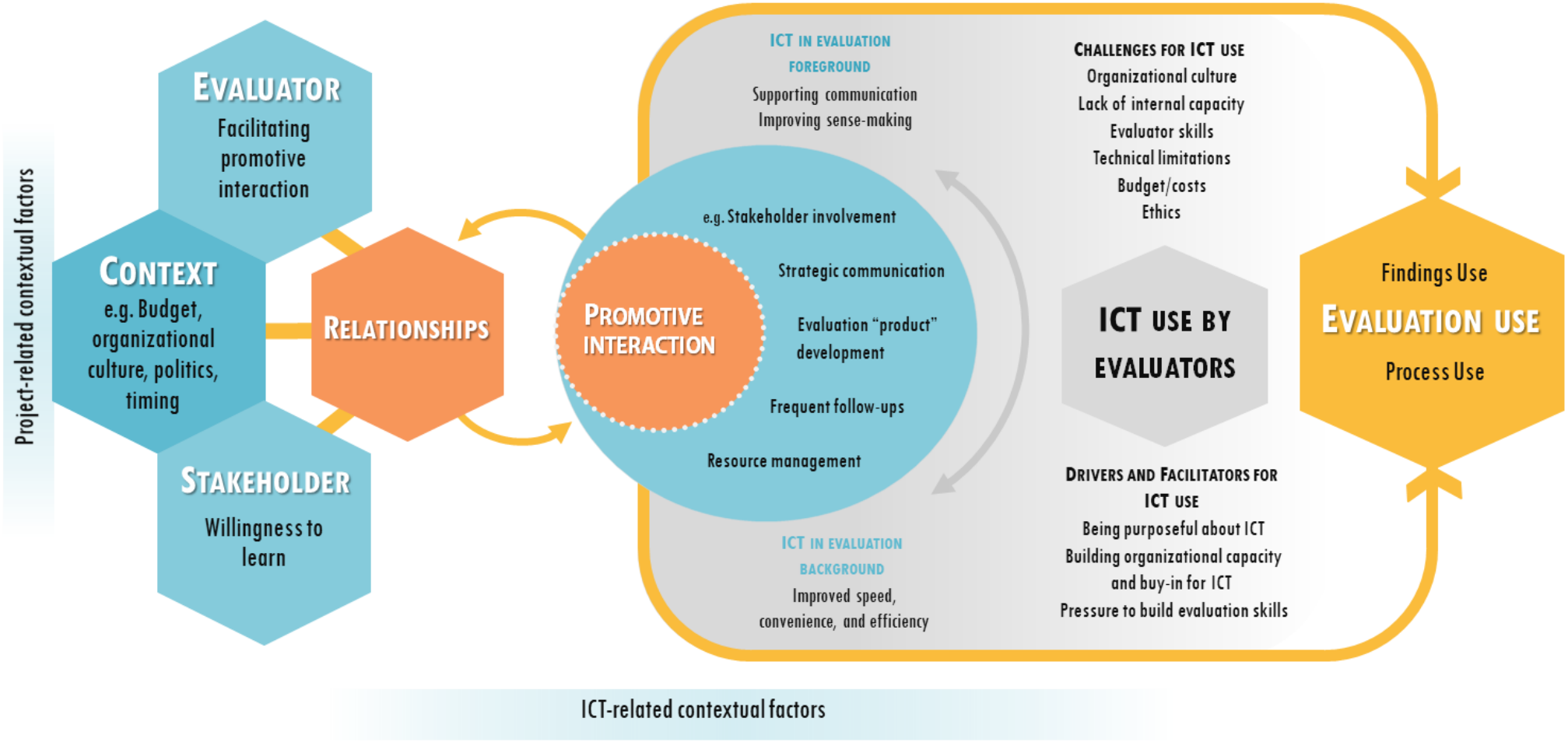

Figure 11: Final Conceptual Framework

Connections to the literature

This research confirms a number of themes that have repeatedly surfaced in the literature review, and it makes a number of important contributions. In the section below I will draw on these prominent themes and highlight how the findings can help further strengthen the existing knowledge base.

ICT - opportunities amidst challenges.

The findings from Study 1 reflect many of the themes from the literature review on ICTs within the evaluation context. For example, the findings are consistent with how academic and gray literatures frame the value of ICT tools – as a deliberate formula of risk versus reward. Seldom did the literature and interview data express their use as being damaging to evaluation, with participants noting the potential for a number of valuable contributions, particularly when it concerned background processes of evaluation. This is consistent with the literature that highlights a number of potential benefits that ICT can bring to evaluation practice, such as helping save time during data collection and analysis stages (e.g. Belden et al., 2013; Materia et al., 2016). However, participants caution against overenthusiasm concerning technology, and noted a number of ethical considerations that remain poorly understood, and as such, still unresolved. These include invasion of privacy, concerns related to data storage and ownership, and underrepresentation of certain groups due to the digital divide, which have been noted in recent studies on ICT (e.g., Azzam & Robinson, 2012; Bamberger, Raftree, & Olazabal, 2016, Bennington, 1999; Materia et al, 2016). Being aware of these risks and advancing ICT implementation at a slow and steady pace thus emerges as a common thread between the literature and thesis findings. However, while the literature focuses predominantly on the benefits and drawbacks of particular tools, it did not sufficiently touch on practitioner-level

barriers. The findings emerging from this thesis, however, suggest that ICT use may be influenced by issues that are not always technological in nature. The issue, in fact, seems predominantly rooted in juggling human capacity, of both evaluators and stakeholders. As participants noted, the burden of learning how to use new tools and speak a 'new language' just to stay ahead of the curve puts some evaluators under a strain. For stakeholders, too, ICT adds a layer of complexity that some organizations are not yet ready to face. For others, it promises a utopia of benefits that, if not managed carefully, results in failed expectations. These barriers, when taken as a whole, may explain why ICT uptake in evaluation has, to date, been perceived to advance at a sluggish pace (Bamberger, Raftree, & Olabazal, 2016; Petersson et al., 2017a).

Evaluation use.

As a professional community, evaluation use is integrally embedded in our psyche. Within research on evaluation, the domain of use has also been one of the most prominent topics and also one of the most well developed. In Chapter 2, I presented a literature review that highlights the theoretical evolution of use, beginning with the origins of program evaluation as a field focused on accountability, to the emergence of the concept of process use. Distinct from other forms of use, process use places heavy focus on teaching stakeholders how to conduct evaluations and think like evaluators. These skills are thought to improve organizations' future capacity for evaluation, and imbue an appetite for data and data-driven decision making, consequently prolonging the potential benefits of undergoing an evaluation process (Patton, 2008). My findings suggest that practitioners who engage with technology are quite utilization-minded, and whose perspective on what makes evaluation 'useful' span the spectrum of existing definitions. One of the findings to emerge from the study was notion of 'relationship use'.

Several interview participants noted that relationship quality at the end of the project is one of the dimensions that, for them, defines evaluation use. The notion of relationships being an important aspect of the evaluation process has been noted by a number of evaluation scholars. For instance, a well-established relationship between the evaluator and stakeholders is classified as an indicator of intermediate evaluation capacity (Bourgeois & Cousins, 2008). Relationships and interpersonal dynamics are also an important aspect of developmental evaluation, which frames them as being essential (Patton, 2016). One of the characteristics of the developmental evaluator role is the "readiness to develop long-term relationships of trust - and to be in 'for the long haul' (Patton, 2016, p. 17). In their review of what influences success in collaborative approaches to evaluation, Whitmore et al. (2017) identify evaluator-stakeholder relations to be a vital factor capable of positively and negatively influencing the outcome of evaluation. Other scholars note that relationship building contributes to building trust (Taut & Alkin, 2003), and rapport that is favourable for future projects (DeLuca et al., 2009). In line with this last point, the interview data suggest that thinking about relationships as a potentially measurable outcome of evaluation use, and thus not only as a pathway but a possible destination, may lend a new perspective to evaluation use theory.

Navigating between contexts and roles.

Context, as a concept, has repeatedly emerged as a recurring and indisputable element of evaluation use (e.g. Cousins, 1996; King & Stevahn, 2013; Preskill & Torres, 1999; Preskill et al., 2003; Shulha & Cousins, 1997). While context was incorporated into the original framework it was depicted as an element of equal value, the literature review and interview findings later shifted this understanding by revealing that context may have a more foundational role to play.

In other words, it is an element that is essential to situating the parameters of evaluation and in many ways determining what can be achieved from the outset, as was noted by Taut and Alkin (2003). It became evident that while permitting variation in how we conceptualize use, context also obscures clarity thereof. The interview findings corroborated this by showcasing that practitioner perceptions of use not only vary considerably, they are also extensively informed by an awareness of contextual differences among projects. The resulting strategies discussed by participants were thus framed as contextually dependent guidelines.

The findings also reveal that we can think about context as a structuring modifier at multiple 'levels' – within the evaluation project as a whole, but also within the scope of how ICTs are used and implemented. In their work on evaluation capacity building, Bourgeois and Cousins (2008) noted that a number of dimensions that influence an organization's capacity to conduct and use evaluation[40]. However, my findings suggest that, within the ICT-related contextual 'sub-level', barriers, drivers and facilitators may emerge that exist outside of other contextual factors affecting the project as a whole. As interview findings suggest, this results in a persistent navigation to determine how ICTs can fit into the evaluation approach in the most appropriate way. This too helps inform the literature strand summarizing ICT use in evaluation (e.g. Belden et al, 2013; Corlazzoli et al., 2014), as these studies and reports recurrently pointed to the importance of prioritizing user needs before technology, and advised assessing contextual needs of those users prior to implementation. This harkens back to the notion of the evaluator as a facilitator, a notion that distinguishes considerably from that of an objective observer. Scholarly works on evaluation use have long placed an emphasis on this facilitative role,

[40] Under 'capacity to do evaluation', the authors list (1) human resources, (2) organizational resources, (3) evaluation planning and activities. Under 'capacity to use evaluation, dimensions of (4) evaluation literacy, (5) organizational-decision making, and (6) learning benefits are included.

implying that evaluation use is something that must be pushed for and actively pursued (e. g. Shulha & Cousins, 1997). My findings suggest that this is also the case for ICT implementation. As evaluators continue to mediate between contexts, their role may come to include that of ICT champions, as some of the participants expressed in the interviews. This new role would entail helping stakeholders' capacity to use ICTs for evaluative purposes; fostering partnerships with IT professionals and learning 'a common language, and lastly; contributing to building sustainable ICT systems. However, the prospect of this role raises questions about new responsibilities and the degree to which evaluators should pursue the unbridled quest for use. Can evaluators afford treading further away from being an 'objective observer' to a role of ICT mediator, and should they? The theoretical debate on evaluators' responsibility, and perhaps even capability, towards evaluation use and how it should be bound is thus renewed.

Limitations

This section discusses a number of limitations of the research, commencing with data collection limitations that negatively bounded the extent of the study. This thesis presents findings from an insightful group of contributors in Study 1, the results of which informed data collection for Study 2. However, as with most studies of qualitative nature, the findings presented here are influenced by individual perspectives and are bound by their unique lived experiences. While this can be a strength with respect of obtaining rich and varied points of view, it can be problematic for generalizability of findings. Related to this, attempts to generalize findings from Study 2 are necessarily limited to a relatively meagre sample of evaluators given the exposure of the invitation. It seems that research in this field is becoming increasingly challenging; possibly evaluation community members are starting to feel over

studied and overwhelmed by requests. Some societies allow only limited access to members. In the case of the American Evaluation Association, the survey was sent to 1000 randomly selected members, representing roughly 10% of the membership. The Canadian Evaluation Society currently has a new research policy under review that would restrict survey requests to two per year. My sense is that the current response rate reflects to some degree the changing state of receptiveness to research participation. Therefore, even though I achieved a final sample of over 300, findings should be interpreted with a modicum of caution. Another significant and somewhat surprizing occurrence in both Study 1 and Study 2, evaluators were unwilling to nominate a stakeholder participant, even with promises of confidentiality. In Study 1, evaluator participants provided legitimate reasons for being unable to nominate a counterpart, including narrow project timelines, and heavy stakeholder workloads. Most of the participants were apprehensive about contacting their former clients given that project was no longer ongoing, and that stakeholders are often busy with new demands. In Study 2, from a sample of over 300 evaluator participants, only 13 stakeholder participants were nominated. Disseminating the survey, initially, and after a follow-up, yielded zero responses. Therefore, since no stakeholders took part in this study, Research Question 5 on the convergence of evaluator and stakeholder perspectives became impossible to answer. I note that the 'yoked sample' strategy has been used in the past in the evaluation community with some success. A survey of evaluators engaging with collaborative approaches yielded a sample of over 500 and valid responses were received from over 70-program stakeholder paired counterparts (Cousins, 2001). However, this study took place over 20 years ago perhaps under conditions that were more favourable to research participation requests.

Regrettably, not generating data to answer Research Question 5 renders the current findings evaluator practitioner-defined, and may not, perhaps are even unlikely to, accurately reflect various stakeholder interests. They are also based on self-reported data and thus have the potential to be biased, especially in cases where the evaluator may have felt that their credibility would be questioned despite the data being completely anonymous. As a result, this limitation should be carefully considered prior to interpretation or use of the findings. Below I comment on the implications for ongoing research of exploiting the stakeholder perspective in understanding the interface between ICT and evaluation use.

Another limitation concerns research logistics. Ironically, technical difficulties with the Qualtrics platform complicated data collection pertaining to contextual barriers in Study 2. The platform's branch logic does not easily permit dynamic 'pop-up' questions following a selection. For example, if a participant selected option A from a long list, Qualtrics does not offer a way for follow-up questions to dynamically appear on that page, below the selection. The options instead allow for all selections to be made first prior to taking the participant to the next page where follow-up questions would then be displayed. Experimentation with this approach to the survey resulted in not only a cumbersome survey design, but also lengthened the survey to nearly thirty minutes. Given that survey participation is commonly believed to decrease with each added question, lengthening it further introduced the risk of obtaining a poor response that would be insufficient for analysis. Another obstacle was the inability to effectively capture context given its inherent variability across sectors, evaluation types, and the like. Although some qualitative data were provided in the form of open-ended responses, it bears saying that this component was likely insufficiently captured. Thus, when considering contextual barriers identified and outlined in Study 1, readers of this research should bear this limitation in mind.

Implications

This study aimed to contribute to research on evaluation by studying evaluation use from a perspective that has not, to date, been adequately explored. An implicit assumption of the research that use in its many forms still means a great deal to evaluators, and remains an important consideration for practice. The study also underscored the interpersonal character of evaluation, as evaluators' strategies and tactics for use, with and without the use of ICT, were often so context-specific. Given that this was an exploratory study, a number of implications arose for practice (professional associations, evaluation practitioners), as well as for researchers.

Implications for evaluation associations and societies.

Given the growth of ICTs thus far, we can assume that this is not merely a passing trend but a prognosis of the future. ICTs are a fundamental feature of this era, and "are critical to strengthening the quality of the work that evaluators perform" (IFAD, 2017, p. 9). While a small number of evaluator practitioners are already using ICT in practice, the field at large must deliberately draw attention to the ongoing technological revolution that is taking place.

Evaluation societies and associations worldwide have to play a role in keeping abreast of trends that develop beyond our field, and contemplate how tools developed in other fields can be tailored for use in evaluation. However, as I discussed above, technology is sometimes viewed as 'the unknown', and 'fear of the unknown' can act as a barrier to implement new tools or learn new techniques. The result is somewhat of a dilemma whereby the user-oriented character of evaluation practice can also act as its own inhibitor to innovate. In other words, if what we seek is merely a list of 'what works', our field will be obliged to wait for innovation to take place

elsewhere. For professional associations, what lies ahead may thus be two-fold. One of these tasks is having foresight about what is on the horizon, and the other is building opportunities for evaluators to expand their know-how. With regards to developing foresight, a number of participants pointed to innovations in ICT, such as tools used for monitoring (drones and remote sensing), 3D printing, and the 'Internet of Things', that may have a role to play in the field of evaluation but have not yet entered the mainstream conversations. Another is the ongoing use of artificial intelligence to build models with the purpose of informing policy-making. One such example is the work currently being undertaken by the Virginia Modeling Analysis & Simulation Center, where researchers are applying data analytics and other forms of inquiry, such as document review, surveys, and consultations with stakeholders, to build models that can inform policy-making on subjects of public health policy and transportation planning (Virginia Modeling Analysis & Simulation Center, 2017). Is this a future direction for decision-making? If so, should evaluation take part in this revolution, or at the very least, offer insights from our longstanding discipline? The video game industry too has flourished over the last several decades, and continues to do so, if its recent transition to mobile platforms is to be of any indication. As their value becomes apparent, philanthropic investment in educational gaming has been likewise on the rise (Bill & Melinda Gates Foundation, 2009). It is not inconceivable to picture this technology being used for evaluation purposes. Can 'gamification' surface new approaches to evaluative learning, or offer alternate methods for data collection?

Igniting these conversations may require leadership in professional associations to have the foresight to hone skills that will meet a demand that has not yet materialized. This also necessitates ushering evaluators to step out of comfort zones, and to become intellectually inquisitive about new possibilities that go beyond what is currently expected. Building

opportunities also means creating digital and physical spaces for safe experimentation. This may help avoid stagnation and circumvent the field's desire to stick with the tried-and-true.

Journal editions dedicated to the use of ICT in evaluation can be the start of this conversation, as well as other outlets that would enable pioneering evaluators to share their learnings, most specifically, lessons rooted in practical experiences. Opening doors for practitioners from other spheres to speak and share their knowledge may be equally important, as I will note in the next section. Together, these steps may act as a stepping stone to producing a generation of better informed professionals.

Building interdisciplinary linkages.

As noted by Petersson et al. (2017b), the future of technologies like big data is not one that evaluators can very reasonably tackle alone. For example, Colville (2013) noted that a number of innovations in monitoring and evaluation originated and continue to originate in different realms, including the private sector, academia, and NGOs. If we lack insight into some aspects of ICTs - and my literature review on this topic attempted to show that we indeed do - building connections with fields that have advanced further ahead may be a useful step for program evaluation organizations. This new role entails drawing much-needed linkages across fields in ways that contribute to the traditionally interdisciplinary character of program evaluation, and thus accelerate the rate of learning within the field. Doing so would help lay the foundational stones for a common language between evaluation and technology fields, which I identified as a persistent barrier to greater ICT use.

These linkages may already be forming, as noted by the growth of MERLTech, a conference and online community dedicated to learning more about ICT use in monitoring,

evaluation, research and learning (MERL). The International Fund for Agricultural Development (IFAD), a specialized agency of the United Nations, also hosted an international conference on 'Information and Communication Technologies for Evaluation' in 2017, which invited practitioners to showcase and discuss various ICT applications, predominantly in international development contexts. However, these are largely isolated instances and represent undercurrents of learning that may not yet be reaching the field as a whole, if this is to be gauged from the scant presence of sessions dedicated to ICT in most national conferences such as AEA, CES, and EES. Therefore, professional evaluation associations have an identifiable role to play in devising a practical learning strategy that will help guide evaluation into a new era.

Addressing Ethical Considerations.

Concerns over ethics have long been a part of evaluation, and ICT adds a new dimension to these existing challenges. As of May, 2018, the American Evaluation Association introduced an updated principle to guide for systematic inquiry, "Carefully consider the ethical implications of the use of emerging technologies in evaluation practice" (AEA, 2018). This principle has not yet been introduced to the Canadian Evaluation Society's ethical guidelines, nor the Australasian Evaluation Society's Code of Ethics and Practice. Although the principle is currently broad, the field would likely benefit from a collective discussion of what risks exist, and what strategies can alleviate the possibility of causing harm. What specific obligations do evaluators have in light of technological growth? Should minimal proficiency and understanding of tools be required of evaluators prior to their implementation? If not, what steps should be taken to ensure that no harm is caused? Finally, given our growing awareness of the digital divide, should we make the conscious decision to rely on ICT *less* if doing such would meet the needs of certain

groups? An ongoing discussion about the role of ICT and its relation to ethical responsibilities of evaluators will therefore be a useful stepping stone.

Implications for evaluation practitioners.

This study's findings point to the importance of a tailored approach to ICT implementation. To help evaluators who are looking to experiment with ICTs, the following questions can serve as a useful starting point for deliberating that approach. Informed by participant feedback and the literature review, these questions pertain to the purpose of the evaluation, technical feasibility of ICT, and capacity of stakeholders and the evaluator.

Purpose

- What is the purpose of the evaluation? How can the existing ICTs support this purpose? What new tools may be required?
- What are the information needs and learning styles of primary/secondary stakeholder participants (e.g. findings use, process use)?
- What is the added value of ICT for background and foreground processes (e.g., improved data collection, efficiency, stakeholder reach or depth of engagement, etc.)?
- What potential ethical barriers can ICT inadvertently contribute to or help alleviate?

Capacity

- What is the evaluator's capacity to use the ICT in question? What training may be required?
- What is the stakeholders' capacity for using ICT? How realistic are the demands or expectations concerning ICT?
- Is there an openness or commitment to ICT use, exemplified by dedicated human capacity or budgetary allowances for implementation or training? Is investment in ICT sustainable in the client organization (i.e. not a never-to-be-repeated occurrence)?
- What partnerships or knowledge networks exist to help streamline ICT use?

Feasibility

- What are some technical barriers to implementation of ICTs? (e.g., connectivity, availability, user-friendliness, compatibility, etc.)

I intend the questions to be treated as a guideline rather than a bullet-point recipe. Using these questions in conjunction with Study 1 findings on strategies for evaluation use can also help practitioners formulate a stratagem for ICT use. For example, the purpose of the evaluation and stakeholder needs help inform if ICT should be used in background or foreground processes. If the evaluation is learning-oriented, evaluator could establish the parameters of the existing learning culture or individual learning styles, and establish a strategy for ICT use that corresponds to that culture and stakeholder needs. This process emphasizes the need for an established balance between purpose, technical limitations, and evaluator and stakeholder capacities until these three spheres formulate a customized 'fit'. In that sense, learning how to embed ICT is akin to needs assessment, drawing on a number of the same tactics that many evaluators should be familiar with. This entails focusing on interpersonal relationships, and pursuing a number of other use-focused strategies, examples of which were highlighted by the participants of my qualitative study. Thus, rather than prioritizing ICT use, these tools can instead complement the overall evaluation approach. Keeping in mind that all evaluation contexts are unique, I drafted a diagram depicting what this process might look like in practice (see Figure 12 below).

When it comes to studying current topics such as ICT, practice may be developing quicker than its academic counterpart. Newest learnings are likely to be found in the 'trenches' - at workshops, or across organizations who purchase and engage with new ICTs. While this thesis aims to contribute to the existing knowledge base, it does so with the knowledge that we may soon be looking into the past. This is why a comprehensive picture of ICT embeddedness in evaluation should be an ongoing effort, and one that would benefit greatly from practitioner input. This can be done in three ways. First, as research on ICT is bound to grow, practitioners

should welcome opportunities to participate in empirical research in order for the field to remain informed, and in turn reap the rewards of ongoing technological advancement. Second, evaluation practitioners can also consider using such platforms as blogging, social media, or conference presentations to share lessons learned. This is especially important for practitioners who are engaged in evaluation of ICT-based interventions in health or education sectors. This branch of evaluation may have a unique awareness of emergent technologies that could inform how these same technologies could enrich evaluation methods and processes.

Finally, practicing evaluators with an interest in ICT should engage with their professional associations, or seek linkages amongst its members. Within the AEA, this is achievable by joining the Integrating Technology into Evaluation TIG, although similar interest groups may soon emerge elsewhere.

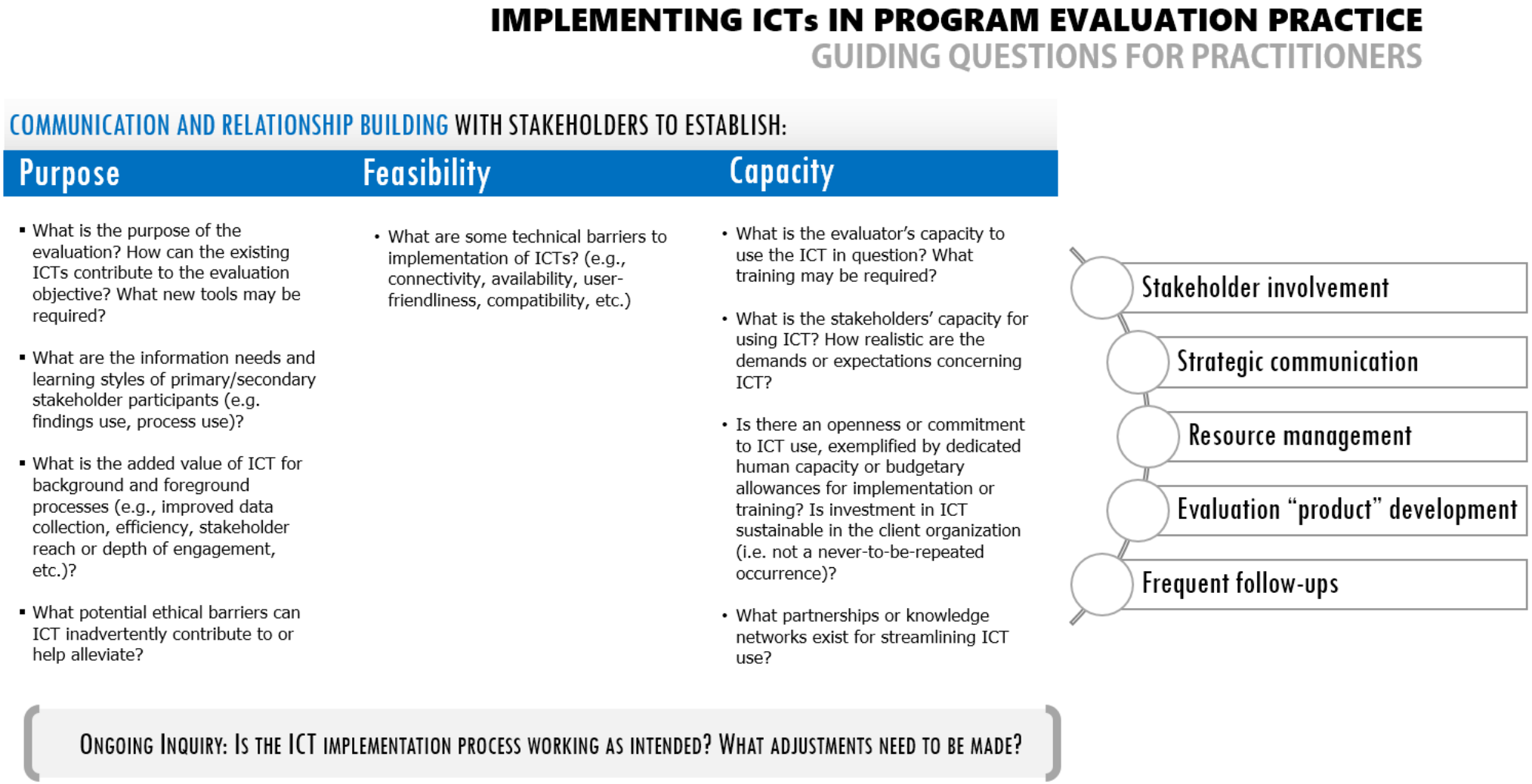

Figure 12: Guiding questions for practitioners

Implications for research.

This study helped kindle a number of important questions worthy of future inquiry. These concern not only new theoretical directions but also questions concerning methodology. In the following section I will review these implications.

As noted above, one of the complications encountered in this project was lack of access to stakeholder participants. Despite numerous attempts, this thesis was ultimately unable to answer Question 5 which intended to examine convergence of stakeholder and evaluator views. Thus, there remain a number of unexplored components that demand further inquiry. One such component pertains to stakeholder perspectives on evaluation use, and how these in turn influence stakeholder experiences with ICT. Obtaining this parallel perspective would thus help build a more nuanced understanding of these issues. The conceptual framework developed as a result of this study can be a useful guide for obtaining these alternate perspectives. Researchers can use the theoretical components it outlines to obtain corresponding insights on the role of context, evaluator and stakeholder participants; explore what is implied by ‘use’ and ‘useful’; and explore what strategies, with or without ICT, can support those strategies. A subsequent comparison of the components to the framework presented here would add further value.

Another theme to emerge was some stakeholders’ averseness towards ICT use, both at the individual and organizational levels. This acted as a significant barrier to ICT implementation for evaluators, as noted by a number of interview participants and in written comments by survey participants. To address this, a review and integration of empirical research from evaluation and adjacent fields should consider how best to pilot or introduce innovations in organizational climates averse to change. Such research may already exist, thus constructing a

synthesis that builds theoretical linkages to program evaluation would be of utmost benefit and a worthy next step.

A number of interview participants noted that many of the advancements in the field in recent years have been adapted from other disciplines and propagated through key actors in the professional community until these advancements became commonplace. Using a technique like social network analysis in conjunction with other methods would help inform how these innovations spread and what points of influence they pass through, adding up to an intellectually intriguing and useful undertaking for imminent developments in ICT.

Concerning methodological implications, researchers engaged in this area may consider employing a case study methodology. This type of methodology may garner data from yoked pairs, and provide an additional point of view on this topic that would be more comprehensive. As context can be difficult to capture with quantitative data, further research would also benefit from a multiple-case study design. One of the benefits of this design is in its robustness and capacity to explore similarities and differences within and between groups (Baxter & Jack, 2008). A multiple-case study design would also help explore contextual intricacies, whether these may be organizational or cultural.

Conclusion

There is currently a dearth of empirical research on the role of ICT in evaluation practice. The focus of this thesis was to empirically explore how evaluators use ICTs in their practice, and how this in turn influences evaluation use, namely process use and use of findings. Based on the literature review conducted, the conceptual framework for this research study identified the role of ICTs as being largely contributory to use. This framework highlighted that evaluation use is

much likely to be affected by other factors such as context, stakeholder and evaluator input, and interpersonal relationships. This, however, does not mean that ICTs have no place in evaluation practice. The results of the qualitative inquiry revealed that ICT contributes to use by operating in background, and to a lesser degree, in the foreground of the evaluation. It has the potential to support evaluative inquiry in a number of ways, including by reducing the burden and cost of doing evaluation, and by turning this long-dreaded exercise into a rewarding and engaging experience that some stakeholders may not even immediately recognize as 'evaluation'. However, challenges remain as evaluators grapple with costs, new skillsets, and the ambiguous ethical implications of using technology. Uptake of newer technologies has thus been slow, as indicated by the literature review and the quantitative findings of this study. Stakeholders, too, can sometimes be apprehensive of technology, signaling a number of important lessons such as being purposeful about why ICT is being used, cultivating buy-in and capacity for ICT use among the stakeholders, and working towards developing new proficiencies for a new age.

The final conceptual framework I developed from the two studies helps to visually articulate the interplay between these various elements. Used in conjunction with guiding questions for practitioners, the framework can also serve as a valuable tool for evaluators crossing into this domain. Informed by evaluation use and social interdependence theories as well as the thesis findings, the framework can also contribute to future empirical inquiry. For instance, its components can be useful for laying the groundwork for future studies focusing on obtaining parallel stakeholder perspectives.

Dette, Steets, & Sagmeister (2016) note that as of 2016, the use of ICTs in M&E already made several far-reaching impacts. The case studies recounted in their report showcase the potential of a number of technologies. One such case is the use of SMS for data collection,

which was used by the World Food Programme (WFP) to monitor impact of programs to battle food insecurity. In contexts where in-person data collection is not feasible, such as zones of persistent conflict, this automatic system ensured that data collection could continue (Dette, Steets, & Sagmeister, 2016). Like much of the data collected for evaluative purposes, these data embody a story of human experience. They reflect within them challenges, potential solutions, and lessons learned. Other case studies of ICT application reveal that these tools, through their various applications for communication, data analysis, and reporting, can also make a significant contribution to streamlining evaluation processes. In light of our ever changing world, empirically gaining further insight into the role of ICT would be most pertinent to the future of the field.

This study illustrated that ICT acts as 'quiet' contributor to evaluation use, but one that adds steam to a human-powered endeavour. Under the right conditions, however, ICTs can nonetheless elevate program evaluation to be more efficient, responsive, and inclusive, which are things that we as a field should aspire to. By improving evaluation processes, outputs, and extending reach, evaluators can be better poised to face the challenges of the rapidly changing global landscape, and contribute to social betterment, which remains at the heart of this field.

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Appendices

Appendix A: Study 1

Appendix A1. Introductory e-mail invitation – Evaluation Practitioners

Greetings,

One of my better Ph.D. students, Kate Svensson, is researching the role of information and communication technologies (ICT) in promoting stakeholder engagement with evaluation. In the context of this research, ICT includes hardware and software (e.g., tools for communication, data collection, productivity, analysis and interpretation, and dissemination) that enable collaboration among users. As you are aware, not much has been published on this topic and this is especially true for empirical research.

One of Kate's studies is an interview study with prominent contributors in the domain of ICT and evaluation. Kate would very much like to interview you because of your prior contributions in this area.

Kate will follow up with an official invitation in the next few days, along with a letter of informed consent that provides all of the relevant details about the study. I would be very grateful if you would give her request for a single skype interview session serious consideration.

Thanks so much, and best wishes.

J. Bradley Cousins. Ph.D.

Professor Emeritus, Faculty of Education and

Senior Researcher, Centre for Research on Educational and Community Services

University of Ottawa, VNR-5002G

136 Jean Jacques Lussier

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Skype: bc0027

Appendix A2. Recruitment Letter – Evaluation Practitioners

Subject: Participation in a thesis study – **'**Information and Communications Technologies (ICT) in Program Evaluation Practice: Pathways to interaction and process use'

Dear ___,

My name is Kate Svensson, and I am conducting a study for my doctoral thesis, supervised by Dr. J. Bradley Cousins at the University of Ottawa, Faculty of Education. The objective of this study is to generate learning about the use of information and communications technologies (ICT) in evaluation practice, with a special focus on identifying how ICT can promote an interactive environment for stakeholders, and what role it may play for promoting evaluative learning. I am also interested in identifying what contexts may be most appropriate for technology use. Would you be willing to provide input about this topic by participating in an interview? You will also be asked to nominate an evaluation stakeholder with whom you have worked within the last two years. A request for an interview will be made of the stakeholder in order to obtain a comparative view on views about technology use.

Your information would be kept strictly confidential. Findings from the study will be reported in aggregate form. The interview would take approximately 45 minutes, and would be conducted by telephone or by Skype at a time convenient to you.

If you are interested in participating, or if you have any questions, please respond to this letter. If you do not wish to participate, please feel free to decline. I would appreciate your reply by [date].

The thesis study is titled 'Information and Communications Technologies (ICT) in Program Evaluation Practice: Pathways to interaction and process use'. If you have any questions about the ethical conduct of this study you may contact the Protocol Officer for Ethics in Research, University of Ottawa, Tabaret Hall, 550 Cumberland Street, Room 154, Ottawa, ON, K1N 6N5, tel.: (613) 562-5387 or ethics@uottawa.ca.

Thank you,

Kate Svensson
Doctoral Candidate, Faculty of Education, University of Ottawa

Appendix A3: Letter of Informed Consent – Evaluation Practitioners

Project title: "Information and Communications Technologies (ICT) in Program Evaluation Practice: Pathways to interaction and process use"

Invitation to Participate: You are invited to participate in a research study led by doctoral candidate Kate Svensson, and supervised by Dr. J. Bradley Cousins. This study will be a component of a doctoral thesis that is currently being undertaken at University of Ottawa, Faculty of Education. Your participation in this study is completely voluntary; thank you for considering this invitation.

Purpose of the Study: The objective of this study is to generate learning about the use of technology in evaluation practice, with a special focus on identifying what role technology has to play in encouraging interaction and learning of stakeholders, as well as overall use of evaluations. The researcher is also interested in identifying what contexts may be most appropriate for technology use.

Participation: Your involvement will consist of participating in one private interview where you will be asked questions about your most recent experiences with technology in an evaluation, and your views on its role as a facilitator or inhibitor within the evaluation process. The interview will last approximately 45 minutes and will be conducted by telephone or Skype at a time convenient for you. With your permission, the interview will be audio-recorded to ensure the accuracy of the information collected. You will also be asked to nominate an evaluation stakeholder with whom you have worked within the last two years. A request for an interview will be made of the stakeholder in order to obtain a comparative view on views about technology use.

Assessment of risks: Your participation in this study entails no foreseeable risks. You may decide to withdraw from the research at any time.

Benefits: By sharing your insight and views on technology use, you will contribute to the development of theory regarding this topic, which will later be shared within the program evaluation community. Lessons derived from the study are thus likely to have practical applications.

Privacy of participants: All information gathered will remain strictly confidential and will be accessible only to the researcher. Identities of individuals and organizations will be withheld from any reports arising from the research. A transcript of the interview that you give will be shared with you for review and comments. The interview transcripts and other data derived from the evaluation stakeholder nominated in the study will be kept confidential, and only aggregate results from the analysis will be shared in the final report.

Confidentiality and conservation of data: The information gathered will be securely stored for five years in electronic form on a password-protected personal computer. Only the doctoral candidate will have access to the data.

Voluntary Participation: If you choose to participate in the study, you may withdraw at any time and/or refuse to answer any questions without suffering any negative consequences. If you choose to withdraw, all data gathered until the time of withdrawal will be destroyed.

Acceptance:

□ I, _____[Name of participant], agree to participate in the interview, as described above.

If you have any questions about the ethical conduct of this study, you may contact the Office of Research Ethics and Integrity, University of Ottawa, Tabaret Hall, 550 Cumberland Street, Room 154, Ottawa, ON K1N 6N5; Tel.: [613) 562-5387; Email: ethics@uottawa.ca

Participant's name	Signature:	Date:
Researcher's name	Signature:	Date:

Appendix A4: Interview Guide – Evaluator Practitioners

1. Please describe the context of your last evaluation:

- What kind of project was this (objectives, timelines, etc.)? What kind of program?
- What kind of evaluation (participatory, developmental, etc.)?
- Who were the stakeholders?
- How was ICT used (what kind and for what purpose)? What role did ICT play in this evaluation project? Did the use of ICT have any unanticipated results?
- What was the stakeholders' experience with technology use (positive/negative)?
- Did ICT enhance stakeholders' experience? Did it contribute to process use?

The next section will address your experiences with ICT within your evaluation work:

- Are these experiences positive or negative?
- At what stages, in your view, is technology more prevalent? (Such as recruitment, data collection, analysis, dissemination of findings, etc.?
- Have you encountered any barriers to using technology in your practice? If so, what were they and how did you address these barriers?
- What are some facilitators to using technology?
- In general, what does technology mean for your evaluation practice?
- What do evaluators need to face trends concerning technology? What is the role of professional societies in the coming years, concerning these trends?
- In what way, if at all, did the use of these tools promote (a) interaction; (b) stakeholder learning; (c) use of evaluation findings (i.e. Final report, summaries, other forms of dissemination, etc.)

2. Generally speaking, how important is evaluation use to you and within your evaluation practice?

- Why is it important/not important? Is it a priority?
- How do you approach evaluation use? What do you consider 'useful'?
- Based on your experience, can you please talk about the factors that influence evaluation use? What might be some of the factors that influence evaluative learning?
- What is required of the evaluator to foster this kind of learning? What is required of the stakeholder?

3. Are you open to nominating a stakeholder to take part in this study, in order to obtain their view on use of ICT? Are you familiar with other evaluator practitioners who actively use ICT in their practice? If so, would you be open to nominating these individuals to become participants in the research study?

Appendix A5 – Research Question Matrix for Study 1

Research Question Matrix

Research Questions	Interview Items (Study 1)	
	Evaluation Practitioners	**Community Members (Evaluation Stakeholder)**
What is the role of ICT in facilitating promotive interaction of program community members undergoing the evaluation process?	• Please tell me about your experience with using ICT in evaluations? Are these experiences positive or negative? • Have you encountered any barriers to using technology in your practice? If so, what were they and how did you address these barriers? • What are some facilitators to using technology? • In general, what does technology mean for your evaluation practice? • In what way, if at all, did the use of these tools promote (a) interaction; (b) stakeholder learning; (c) use of evaluation findings (i.e. Final report, summaries, other forms of dissemination, etc.)	• Please tell me about your experience with using ICT in evaluations? What about other projects? Are these experiences positive/negative? • Have you encountered any challenges/barriers to using ICT in evaluation? If so, what were they, and how did you address these barriers? • In what way did the use of these tools help to make the evaluation 'useful'? • In general, what does technology mean to you? • Did the use of ICT encourage your interaction? Did the use of ICT promote learning?
In what way does the use of these tools influence learning (process use), and the use of evaluation findings?	Generally speaking, how important is evaluation use to you and within your evaluation practice? Why is it important/not important? Is it a priority? How do you approach evaluation use? What do you consider 'useful'? • Based on your experience, can you please talk about the factors that influence evaluation use? What might be some of the factors that influence evaluative learning?	How important is it that the evaluation taking place in your organization is useful? Is it a priority? What do you consider 'useful'? How important is it that you learn from an evaluation, or build your capacity to do future evaluations? • Based on your experience with evaluation, can you please talk about the factors that influence this kind of learning, or have done so in the past?

	• What is required of the evaluator to foster this kind of learning? What is required of the stakeholder? • In what way, if at all, did the use of these tools promote (a) interaction; (b) stakeholder learning; (c) use of evaluation findings (i.e. Final report, summaries, other forms of dissemination, etc.)	• What is required of the evaluator to foster this kind of learning? What is required of the client? • Did the use of ICT encourage your interaction? Did the use of ICT promote learning?
Which situations/evaluation contexts may or may not be most appropriate for ICT use?	Please describe the context of your last evaluation: • What kind of project was this (objectives, timelines, etc.)? What kind of program? • What kind of evaluation (participatory, developmental, etc.)? • Who were the stakeholders? • How was ICT used (what kind and for what purpose)? What role did ICT play in this evaluation project? Did the use of ICT have any unanticipated results? • What was the stakeholders' experience with technology use (positive/negative)? • Did ICT enhance stakeholders' experience? Did it contribute to process use? At what stages, in your view, is technology more prevalent? (Such as recruitment, data collection, analysis, dissemination of findings, etc.?	Please describe the context of your last evaluation: • What kind of project was this (objectives, timelines, etc.)? • What kind of evaluation (participatory, developmental, etc.)? • Did you learn from this evaluation, and if so, in what way? How important is learning during the evaluation process? Why is it important/not important? • How was ICT used (what kind, and for what purpose)? • At what stage of the evaluation process is using ICT most helpful? • In what ways can using ICT in evaluation be made easier? • In this particular evaluation, was your experience with technology positive or negative?
In what way do evaluator and stakeholder perceptions of ICT as a promotive interaction tool converge?		

Appendix B: Study 2

Appendix B1: Letter to evaluation societies

Greetings!

My name is Kate Svensson, and I am a PhD candidate at the University of Ottawa in Canada. Under the supervision of Professor J. Bradley Cousins, my doctoral thesis explores how evaluators engage with emergent technology in their practice, what are the drivers of technology use, and what challenges evaluators encounter. Also of particular interest is how these ongoing trends affect stakeholder involvement and ultimately evaluation use.

One part of my thesis involves surveying members of the American, Canadian, European, and Australasian evaluation societies and associations. With your permission, I would like to contact members of the European Evaluation Society to obtain their views on the subjects above. Please see attached for the copy of practitioner and stakeholder instruments (the surveys are available in English and in French).

Participating in this Qualtrics survey is expected to take no more than 15-20 minutes. At the end of the survey, participants will be also invited to nominate a program or community-based stakeholder with whom they have worked in the recent past to complete a similar survey to obtain parallel, confidential viewpoints on the subject.

The results of this research project will deepen our understanding about evaluation use, help inform the field about future directions, and spark new conversations concerning the growing importance that technology plays in our professional lives. Results will be made available to you in the form of a summary report and an infographic. As well, we plan to publish in academic and professional outlets.

This research is sanctioned by the University of Ottawa Research Ethics Board. All responses will be treated as confidential and pooled for analysis. If you have any questions or concerns you may contact us at the email below or write to the uOttawa Research Ethics Officer at ethics@uottawa.ca.

Thank you for your time and consideration.

Best wishes,

Kate Svensson

Prof. J. Bradley Cousins

Appendix B2: Survey Information Sheet for Practitioners (English)

Dear [Society Member],

Greetings! We are writing to invite you to contribute to a research project about the use of information and communication technologies (ICTs) in the field of program evaluation. With permission, all members of the Canadian Evaluation Society are receiving this invitation.

The purpose of this survey is to identify how evaluators engage with technology in their practice, what drives technology use, and what challenges evaluators encounter. We are also interested in identifying how these ongoing trends affect stakeholder involvement and ultimately evaluation use.

The [**link**] should take about 15-20 minutes of your time.

Please read the questionnaire instructions carefully. At the end of the survey, you will be given the option to nominate a stakeholder who will receive a short companion survey to help us understand how technology use in evaluation affects stakeholders. Participation is completely **voluntary**, and we will treat all received responses **confidential**.

We would appreciate your reply by **May 20th**. After we gather and analyze the data, we plan to publish the research findings and disseminate them within the evaluation community to advance research in this area. The questionnaire provides you with an option to request a summary of the research.

Thank you for your time and consideration!

Sincerely,

Kate Svensson
Dr. J. Bradley Cousins

If you have any questions about the study please contact us at the coordinates below. The ethical aspects of this study have been approved by the Ethics Review Board of the University of Ottawa. If you have any questions regarding the ethical conduct of this study, you may contact the Protocol Officer for Ethics in Research, University of Ottawa at the following address:

Tabaret Hall
550 Cumberland Street, Room 154

Ottawa, Ontario K1N 6N5
(613) 562-5841
ethics@uottawa.ca

Research Project title: *Information and Communications Technologies (ICT) in Program Evaluation Practice: Exploring New Pathways to Evaluation Use*

Research Team*:*
Kate Svensson, University of Ottawa (Doctoral candidate)
J. Bradley Cousins, University of Ottawa (Professor)

Click [here] to unsubscribe from future emails.

Appendix B3: Reminder Message for Practitioners (English)

Greetings!

With permission from the *Canadian Evaluation Society*, we recently invited you to participate in a survey about the use of information and communication technologies (ICTs) in evaluation practice. If you have not done so already, we would really appreciate your participation in this survey before **May 23**!

Please take a few minutes to complete your responses, as your insights will make a meaningful contribution to research on evaluation. The survey can be accessed [**here**]. You may also copy and paste the following link into your browser: [**link**]

Participation is completely **voluntary**; you have the right to refuse to answer any question. Your responses will be treated as **confidential**, and all findings will be presented only in aggregate form.

We sincerely thank you for your contribution!

Best wishes,

Kate Svensson (doctoral candidate)
Prof. J.Bradley Cousins (professor)

Follow the link to opt of any future emails concerning this project: [**click here**]

Appendix B4: Final Reminder for Practitioners (English)

Greetings!

As our data collection draws to an end, we ask that you please consider participating in our survey about the use of information and communication technologies (ICTs) in evaluation practice. Your insights will make a meaningful contribution to research on evaluation.

The survey is available in both English and French and can be accessed [**here**]. You may also copy and paste the following link into your browser: [**link**]

Participation is completely **voluntary**; you have the right to refuse to answer any question. Your responses will be treated as **confidential**, and all findings will be presented only in aggregate form.

Thank you kindly for contributing!

Best wishes,

Kate Svensson (doctoral candidate)
Prof. J. Bradley Cousins (professor)

The ethical aspects of this study have been approved by the Ethics Review Board of the University of Ottawa. If you have any questions regarding the ethical conduct of this study, you may contact the Protocol Officer for Ethics in Research, University of Ottawa at the following address:

Tabaret Hall
550 Cumberland Street, Room 154
Ottawa, Ontario K1N 6N5
(613) 562-5841
ethics@uottawa.ca

Follow the link to opt of any future emails concerning this project: [**click here**]

Appendix B5: Survey Instrument for Evaluation Practitioners (English)

Survey on information and communication technologies (ICT) and evaluation practice

Introduction

You were identified for possible participation in this survey by virtue of your membership in the **Canadian Evaluation Society (CES)**.

The purpose of this survey is to identify how evaluators engage with information and communication technology (ICT) in their practice. Information and communication technologies (ICT) are advancing at unprecedented rates. Defined broadly, these tools aid in the "creation, capturing, storage, and access of information and the support of human communications and interactions" (Hai-Jew, 2011, p. 271). Ongoing developments in ICT are surely being integrated into program evaluation practice. Some examples include connecting evaluators to remote communities, expanding possibilities for data collection and analysis, and diversifying dissemination of findings.

We would like to identify whether and how these ongoing trends affect stakeholder involvement, and ultimately, evaluation use. Also of particular interest is identifying drivers of and challenges to ICT use in evaluation.

The survey instrument begins with questions about your general views and practices concerning ICT and evaluation. It then asks you to identify a specific and recent evaluation project that involved the use of ICT. We would like you to frame your responses in this section by your experience with the specific project.

Your questionnaire responses will be confidential. Data will be pooled for analysis and you will not be identified in any way in any reports arising from this research. Please refrain from mentioning your name or any names of individuals or organizations when generating your responses. At the end of the questionnaire, we ask that you provide minimal demographic information and **optionally** your email address if you would like to receive a summary of the results. **Also optional**, we ask you to nominate a member of the organization or program community associated with the evaluation project you identified, because we would like to invite them to complete a companion version of the questionnaire. Part of our interest has to do with the convergence of evaluator and stakeholder perspectives. These responses will also be strictly **confidential**; neither you or the person you nominate will know the other person's responses.

We thank you greatly for your willingness to participate in the research!

The ethical aspects of this study have been approved by University of Ottawa's Office of Research Ethics and Integrity. If you have any questions or concerns, please do not hesitate to contact us via the links below, or contact the University of Ottawa Research Ethics Officer at ethics@uottawa.ca.

Sincerely,

Kate Svensson, doctoral candidate
Brad Cousins, professor

Section 1: General Views on ICT

A1. How often do you rely on ICT for the following aspects of evaluation:

	Never	Rarely	Sometimes	Frequently	Always
Communicating with stakeholders (e.g., video conferencing, interactive whiteboard, team collaboration outlets)	○	○	○	○	○
Planning (e.g., interactive logic models, project management software)	○	○	○	○	○
Data collection (e.g., mobile phones, social media, photo/video monitoring)	○	○	○	○	○
Data analysis (e.g., system mapping, Big Data, qualitative or quantitative analysis software)	○	○	○	○	○
Reporting (e.g., data visualization, digital storytelling)	○	○	○	○	○
Other ☐	○	○	○	○	○

A2. For the following items, think in general terms about ICT use in your evaluation practice.

	Never	Rarely	Sometimes	Frequently	Always
ICT helps to reduce evaluation costs	○	○	○	○	○
ICT helps to improve the quality of evaluation findings	○	○	○	○	○
ICT enhances stakeholder engagement	○	○	○	○	○
ICT adds value to my evaluation practice	○	○	○	○	○
I try to incorporate new technologies in my evaluation practice	○	○	○	○	○
Overall, how often do you rely on technology in your evaluation practice?	○	○	○	○	○

Section 2: Past Project Information

In this section, frame your responses by your experience with a specific recent evaluation (preferably completed within the past three years) in which you applied ICT tools.

B1. Purpose of evaluation (check all that apply):

- ☐ Developmental
- ☐ Formative
- ☐ Summative

☐ Other (please specify):

B2. Sector (check all that apply):

☐ Business and Industry
☐ Community Development
☐ Community Mental Health
☐ Culture/Heritage/Tourism
☐ Economic Development
☐ Education
☐ Health/Medical
☐ International Development
☐ Justice and Corrections
☐ Labour Market/Employment/Training
☐ Public Health
☐ Science and Technology
☐ Social Research
☐ Social Welfare
☐ Multi-Sector
☐ Other (please specify):

B3. Design Elements (check all that apply):

☐ Experimental/Quasi-experimental
☐ Program theoretic
☐ Emergent/Naturalistic
☐ Other (please specify):

B4. Data Type (check all that apply):

☐ Quantitative only
☐ Qualitative only
☐ Mixed-Method

☐ Multi-Method (i.e., different types of data used to respond to separate questions)

B5. Scope of intervention (check all that apply):

☐ Small scale/local
☐ Large scale regional
☐ Large scale national
☐ Large scale international

B6. Duration of evaluation:

◯ < 1 year
◯ 1-2 years
◯ > 2 years

B7. Without naming the organization or program, provide any other details that will help to describe or situate the evaluation (e.g., Was it straightforward? Unique in some respect? Fraught with challenges?)

The following section examines how ICT was implemented in this evaluation, what barriers were encountered, and the outcomes of this implementation.

C. How frequently did you use ICT in this evaluation project?

	Never	Rarely	Sometimes	Frequently	Always
1. Communicating with stakeholders (e.g.,: video conferencing, group messaging, discussion forums, email):	◯	◯	◯	◯	◯
2. Planning (e.g., interactive logic models, project management software, system mapping, file sharing databases)	◯	◯	◯	◯	◯
3. Data collection (e.g., survey development tools, digital data collection devices, photo/video monitoring, social media, mapping)	◯	◯	◯	◯	◯

4. Data analysis (e.g., qualitative data software, quantitative data software, crowdsourcing, Big Data)	○	○	○	○	○
5. Reporting (e.g., data visualization, digital storytelling, dashboard, social media)	○	○	○	○	○
6. Other (please specify):	○	○	○	○	○

Of the categories you identified, how frequently did you use the following?

Communication tools

	Never	Rarely	Sometimes	Frequently	Always	N/A
Video conferencing	○	○	○	○	○	○
Group messaging and chat tools	○	○	○	○	○	○
Discussion forums	○	○	○	○	○	○
E-mail	○	○	○	○	○	○
Other (please specify)	○	○	○	○	○	○

Planning tools

	Never	Rarely	Sometimes	Frequently	Always	N/A
Interactive logic models	○	○	○	○	○	○
Project management software	○	○	○	○	○	○
System mapping software	○	○	○	○	○	○
File sharing databases	○	○	○	○	○	○
Other (please specify)	○	○	○	○	○	○

Data collection tools

	Never	Rarely	Sometimes	Frequently	Always	N/A
Survey development tools	○	○	○	○	○	○
Digital data collection devices	○	○	○	○	○	○
Photo/video monitoring	○	○	○	○	○	○
Social media	○	○	○	○	○	○
Mapping tools	○	○	○	○	○	○
Other (please specify)	○	○	○	○	○	○

Data analysis tools

	Never	Rarely	Sometimes	Frequently	Always	N/A
Qualitative software	○	○	○	○	○	○
Quantitative software	○	○	○	○	○	○
Big data for analysis	○	○	○	○	○	○
Crowdsourcing	○	○	○	○	○	○
Other (please specify)	○	○	○	○	○	○

Reporting tools

	Never	Rarely	Sometimes	Frequently	Always	N/A
Data visualization	○	○	○	○	○	○
Digital storytelling	○	○	○	○	○	○
Dashboards	○	○	○	○	○	○
Social media	○	○	○	○	○	○
Other (please specify)	○	○	○	○	○	○

Other tools:

	Never	Rarely	Sometimes	Frequently	Always	N/A
${q://QID108/ChoiceTextEntryValue/6}	○	○	○	○	○	○

Indicate below how ICT implementation affected this evaluation.

D1. Using ICT added value to the process:

	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
1. Improving communication between stakeholders and evaluator(s)	○	○	○	○	○
2. Reducing the demands on stakeholders with regards to the evaluation	○	○	○	○	○
3. Helping stakeholders learn about doing evaluation	○	○	○	○	○
4. Helping stakeholders learn about how evaluation can be used	○	○	○	○	○
5. Improving internal working processes for the stakeholders	○	○	○	○	○

D2. Using ICT added value to project outcomes:

	Strongly Disagree	Disagree	Neither disagree Nor agree	Agree	Strongly agree
1. Improving trustworthiness of data	○	○	○	○	○
2. Offering rapid communication of findings	○	○	○	○	○
3. Improving accessibility of evaluation findings	○	○	○	○	○
4. Stimulating discussion about the evaluation findings	○	○	○	○	○
5. Stimulating action within the program/project	○	○	○	○	○
6. Reducing evaluation costs	○	○	○	○	○

D3. If there were other unexpected effects, please include these details below.

Besides your use of ICT, we are also interested in a few other aspects of your experience with this evaluation.
Please describe your activities as an evaluator of this project.

E1. I invested time or resources into:

	Never	Rarely	Sometimes	Frequently	Always
Building a working relationship with the stakeholders	○	○	○	○	○
Understanding stakeholders' needs	○	○	○	○	○
Involving stakeholders throughout the evaluation process	○	○	○	○	○
Making the evaluation process engaging for stakeholders	○	○	○	○	○
Discussing with stakeholders how the evaluation results might be used	○	○	○	○	○
Promoting evaluation culture within the stakeholders organization	○	○	○	○	○

E2. After the project was concluded, I followed up with stakeholders about whether the evaluation findings were used:

- ○ Not at all
- ○ Once
- ○ Multiple times

E3. Provide any other relevant details that concern your role as an evaluator in this project:

Indicate the role that the stakeholders played in the evaluation of this project.

F. Identify the stakeholders you worked with most closely (check all that apply):

	Never	Rarely	Sometimes	Frequently	Always
Program funders/sponsors	○	○	○	○	○
Program developers	○	○	○	○	○
Program managers	○	○	○	○	○
Program implementers/staff/frontline workers	○	○	○	○	○
Intended program beneficiaries/recipients	○	○	○	○	○
Members of special interest groups	○	○	○	○	○
Other (please specify) ☐	○	○	○	○	○

Please indicate how well the stakeholders you identified were familiar with program evaluation prior to the project.

	Not at all	Somewhat	A great deal	N/A
Program funders/sponsors	○	○	○	○
Program developers	○	○	○	○
Program managers	○	○	○	○
Program implementers/staff/frontline workers	○	○	○	○
Intended program beneficiaries/recipients	○	○	○	○
Members of special interest groups	○	○	○	○
${q://QID40/ChoiceTextEntryValue/7}	○	○	○	○

Overall, the stakeholders I worked with most closely were:

	Never	Rarely	Sometimes	Frequently	Always	N/A
1. Interested in learning about developing evaluation skills	○	○	○	○	○	○
2. Engaged throughout the evaluation process	○	○	○	○	○	○

3. Interested in the evaluation results	◯	◯	◯	◯	◯	◯
4. Used the evaluation results to improve the program/project	◯	◯	◯	◯	◯	◯

Rate the following aspects of your relationships with the stakeholders with whom you worked most closely.

In the relationship I had with the stakeholders, we:

	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree	N/A
1. Had a clear understanding of roles and responsibilities concerning this evaluation	◯	◯	◯	◯	◯	◯
2. Worked towards a common goal	◯	◯	◯	◯	◯	◯
3. Communicated frequently throughout the evaluation process	◯	◯	◯	◯	◯	◯
4. Shared decision making throughout the evaluation process	◯	◯	◯	◯	◯	◯
5. Were open to new ideas	◯	◯	◯	◯	◯	◯
6. Acknowledged any conflicts as they arose	◯	◯	◯	◯	◯	◯
7. Developed mutual trust	◯	◯	◯	◯	◯	◯

In this section, describe yourself and your role in the evaluation community.

G1. Indicate your primary domain of practice:

▼

G2. In which age category do you fall?

- ◯ 24 or younger
- ◯ 25-34
- ◯ 35-44
- ◯ 45-54
- ◯ 55 or older

G3. For how many years have you been practicing evaluation?

- ◯ 0-5
- ◯ 6-10
- ◯ 11-15
- ◯ 16 years and over

G4. What is your primary role or responsibility in evaluation?

- ◯ Evaluation practitioner (conduct evaluations)
- ◯ Teacher of evaluation/evaluation capacity builder
- ◯ Researcher or theorist
- ◯ Commissioner or overseer of evaluation
- ◯ Other (please specify) _____

THANK YOU for participating in this survey! We greatly appreciate your input. Please consider the following:
A. If you would like to receive a summary of the findings of this research, provide your email address here. Note that providing your email address is optional and if you elect to do so, it will be used only for this purpose.

Yes, I would like to receive a summary of the research when the time comes.

My e-mail: _____

B. As mentioned above, we are eager to explore the convergence of evaluator and organizational/program stakeholder perceptions about evaluation and ICT. To that end, optionally we would be grateful if you would nominate a member of the program or organization associated with the evaluation that you identified above in Section 2. We would then send them an invitation to participate by completing a companion version of the questionnaire.

This person should be very familiar with the evaluation and the intervention on which it was focused. Their responses will be treated as confidential and will be used only for comparative purposes. All data will be pooled for analysis and no evaluator-stakeholder pairs will be identified in any reports arising from the research. If you have any questions or concerns, please do not hesitate to contact us via the email coordinates below.

Yes, I would like to nominate a stakeholder colleague with whom I worked closely on the evaluation I described above. I understand that all data will be treated as confidential (specify nominee):

Nominee's E-mail:

Nominee's First Name:

Nominee's Last Name:

Name of the evaluation project:

Contactinformation:

Kate Svensson

Brad Cousins

Alternatively, you are most welcome to contact the University of Ottawa Office of Research Ethics and Integrity at: ethics@uottawa.ca or 1-613-562-5837

THANK YOU for your time and consideration.