A Phenomenological Exploration of Engineers' Experiences using Communication Technologies in Telework

Master's Thesis Presented By:

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Abstract

Telecommuting is becoming an increasingly popular trend in the modern workforce. Among the growing number of teleworkers are engineers, a profession where communication is a necessity. This study employs a phenomenological research approach to understand and describe the ways in which information communication technology (ICT) affects teleworking engineers' interpersonal communication in the workplace and perceptions of isolation in social and organizational contexts. Uses and gratifications theory and media richness theory were used to better understand teleworkers' selection and use of ICT. The findings revealed six themes: emotional impact, workplace relationships, information communication technology in the workplace, the nature of telework, telework and connectivity, and the organizational role in telework. This study contributes to communication research by adding to the growing body of knowledge about the influence of telework on workplace communication and relationships from the perspective of a niche population, engineers.

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Chapter 1: Introduction

The virtual office, also described as telecommuting, is "a group of people who work interdependently with a shared purpose across space, time, and organization boundaries using technology" (Lipnack & Stamps, 2000, p.18). The virtual office is a unique site of analysis in the study of organizational communication because it transgresses traditional ideas about physical workspaces and the interpersonal interactions within these spaces. In the year 2000, roughly 1.4 million Canadian employees worked from home (Statistics Canada, 2013). In 2008, approximately 1.7 million Canadian employees worked from home, which is an 11 percent increase from 2000 (Statistics Canada, 2013). Telecommuting is becoming an increasingly popular trend in the modern workforce.

Virtual work teams tend to employ a number of different technologies that include of variety of synchronous (i.e., audio conferencing) and asynchronous (i.e., e-mail and web pages) information communication technologies (ICT) (Timmerman & Scott, 2006). The four most important software applications perceived by virtual work teams include: e-mail, voicemail, instant messaging, and virtual private networks (Leonardi et al., 2010). Interestingly, Lurey and Raisinghani (2001) found that virtual teams prefer to use e-mail, telephone, and voicemail more frequently, as opposed to ICTs specifically designed for group interactions like conference calls, face-to-face meetings, groupware, and videoconferences.

Research has shown telework to be beneficial to both the worker and the organization (Fonner & Roloff, 2010; Kurland & Bailey, 1999). Teleworkers may benefit from increased flexibility and autonomy, which allows workers to effectively manage

work and family life, as well as experience greater freedom and decision-making in the workplace (Fonner & Roloff, 2010). Organizations may find telework beneficial as it lowers the costs associated with office expenses, allows for talent-based outsourcing, and improves workplace productivity, as employers report telecommuters tend to be absent less, and have higher job satisfaction and work performance ratings (Kurland & Bailey, 1999).

Despite the many positive outcomes associated with telework, the use of information communication technology may negatively affect interpersonal workplace relationships, which could lead to employee isolation. Kurland and Bailey (1999) write, "The most commonly expressed challenge of telecommuting is overcoming the isolation caused by the separation of the telecommuter from the social network in the traditional work space" (p. 61). Kurland and Bailey (1999) suggest that this isolation can lead to social frustration, as well as professional isolation. Teleworkers who feel as though they are isolated from other co-workers and the organization may experience lower job satisfaction and organizational commitment (Kirkman et al., 2002).

According to Darling and Dannels (2003), engineers spend more than half of their day communicating with colleagues working on projects or with individuals outside the organization. Lappalainen's (2009) study on communication as a key skill for engineers writes, "Engineers no longer manage their daily tasks with plain substance expertise; instead they must be adept at communication, collaboration, networking, feedback provision and reception, teamwork, lifelong learning, and cultural understanding" (p. 123). Due to the crucial role effective communication plays for engineering professionals, it is important to investigate the experiences of engineers who are required

to telecommute and communicate using information communication technologies.

Purpose of Study

The purpose of this qualitative research, using a phenomenological approach, is to understand and describe the ways in which ICT affects interpersonal communication in the workplace, on a formal and informal level, between engineering professionals. Formal communication is defined as, "Interaction that follows officially established channels," which is the instrumental interdependence of work team members (Adler et al., 2009, p. 374; Ducharme & Martin, 2000). In contrast, informal communication is defined by Adler et al. (2009) as, "Communication based on friendships, shared personal or career interests, and proximity" (p. 374). The significance of this study will be to add to the growing body of knowledge about the influence ICTs, as used in telework, have on workplace relationships. This research will provide insight into the participants' lived experience working as teleworkers in engineering and will attempt to understand the influence of ICTs on workplace relationships, perceptions of isolation, and work outcomes, including work productivity, job satisfaction and job retention.

Researchers suggest that further investigation is required to understand how workplace relationships affect job performance (Golden, Veiga, & Dino, 2008). Golden et al. (2008) write, "Research should focus on the mediating role played by the nature and quality of work relationships that are impacted by professional isolation and that, in turn, influence job performance" (p. 1417). This study will examine the role ICTs have in the development of workplace relationships and will highlight the need for successful social and organizational relationships within the workplace to promote productivity, job satisfaction and job retention. Additionally, communication researchers are curious about

the effects ICTs have on workplace relationships (Fay & Kline, 2011). Fay and Kline (2011) found that neither teleworkers' relationship quality or informal communication influenced greater job satisfaction or organizational commitment. Fay and Kline suggest that researchers focus their attention on different types of teleworkers, as high-intensity teleworkers may occupy jobs that require less regular interaction. "Future research could focus on discovering other types of informal communication practices that are relevant to high-intensity teleworkers" (Fay & Kline, 2011, p. 159). This research will provide insight into this gap in literature, as it examines the role that interpersonal communication has on workplace relationships in a niche industry, where high-intensity telework may be used and where frequent communication is often required.

This research will aim to draw connections between technologies used in telework, the influence these technologies have on workplace relationships, and the importance of workplace relationships for engineering professionals. Examining the perceptions and experiences of the participants is essential in making these connections. It is the hope of the researcher that this study will provide the reader with an in depth understanding of the participants' experience of this phenomenon. Furthermore, this study will aim to provide recommendations for good practices for organizations that offer teleworking arrangements to employees.

Research Questions

This study seeks to understand the following research questions:

1. How does the use of ICTs in telework affect interpersonal communication between private sector engineering professionals?

2. How does computer-mediated communication in the workplace affect an employee's perception of being isolated in social (informal) and organizational (formal) contexts?

Theoretical Framework

For the purpose of this study, two theoretical perspectives will be considered to explain how information communication technology is perceived and utilized, as well as how ICT affects communication between users. The first of these theories is the uses and gratifications theory (U&G).

Uses and gratifications theory is used to explain why users choose a particular communication channel and message, and examines the interpretation, response and impact of this selection (Rubin, 2009). U&G believes that users actively engage with media and that they make rational decisions to determine which type of media will fulfill their personal needs and values (Dainton & Zelley, 2011). McQuail (as cited by Dainton & Zelley, 2011) identified four overarching motivations that influence users' choice in media. These include: entertainment, information, personal identity, and personal relationships/social interaction. Furthermore, these motivations can be categorized as being ritualized (for diversion) or instrumental (for goal-oriented outcomes) (Rubin, 2009). While literature on U&G is primarily centered on traditional types of media (television, newspaper, radio, etc.), in the last decade scholars have shifted their focus to interactive media outlets in the context of U&G.

Uses and gratification theory provides a logical framework for this study, as it accounts for human motivation in the selection of media. This is appropriate as the goal is to explore how ICT affects teleworkers' ability to communicate for social and

informational reasons.

The second theory to be considered is media richness theory (MRT), which highlights the importance of using an appropriate communication medium for the content of the message. Media richness is determined by evaluating four characteristics: speed of feedback, ability to personalize the message, availability of multiple cues, and language variety (Dainton & Zelley, 2011). Based on these factors a medium can be labeled as rich or lean. According to Daft and Lengel (1983), face-to-face communication is the richest form of information processing because it allows for multiple cues (body language, facial expression and tone of voice), and immediate feedback. Video conferencing and telephone are also thought to be rich media forms, whereas written communications, such as instant messaging, e-mail and letters, are less rich because visual and audio cues are limited (Dainton & Zelley, 2011).

Media richness theory is suitable to guide this study, as the goal is to understand how particular ICTs in telework affect communication between employees. Examining the appropriateness of the medium for the message is beneficial in attempting to understand the interpersonal communication between colleagues in telework.

Structure of Research Paper

This study is presented in six chapters. Chapter one has provided a brief overview of the present study, including the purpose of the study, research questions, theoretical framework, and structure of the research paper.

Chapter two provides a review of existing literature on telework and workplace relationships, and presents a comprehensive overview of the theoretical frameworks used to guide this study. The sections of the literature review include: history and evolution of

telework, technology used in telework, benefits and disadvantages of telework, communication in engineering, importance of workplace relationships, workplace relationships and telework, belonging and isolation, uses and gratifications theory, and media richness theory.

Chapter three examines the research methodology employed in the study. This includes a discussion of the study's research design, data collection and analysis methods, and validation strategies.

Chapter four provides the results of the study, which are based on ten semi-structured interviews with engineering professionals who have experienced working as teleworkers. The results revealed six main themes: emotional impact, workplace relationships, information communication technology in the workplace, nature of telework, telework and connectivity, and organizational role in telework.

Chapter five discusses the findings of the study in connection to the main research questions, key literature, and theoretical framework.

Chapter six is a summary of the main themes and conclusions. The limitations of the study, directions for future research, and practical recommendations are also provided.

Chapter 2: Literature Review

In this section, key literature on telework and workplace isolation in the field of engineering is highlighted in seven main sections, including: history and evolution of telework, technology used in telework, benefits and disadvantages of telework, communication in engineering, importance of workplace relationships, workplace relationships and telework, belonging and isolation, uses and gratifications theory, and media richness theory. These sections will help to frame the study, as well as offer insight into important issues on the topic of telework and workplace isolation.

History and Evolution of Telework

Illegems and Verbeke (2003) provide an inclusive definition of telework using five variables. In this definition, teleworkers may work both on and off the employer's premises, they may work from their homes or premises near their homes, they may be self-employed, an employee, a director of a business, a contract worker or a volunteer, they may use any type of telecommunication technology, and they may have varying relationships with their employers (full-time for a single employer, part-time for several employers, etc.). In addition, Illegems and Verbeke (2003) highlight six types of teleworkers: the satellite office worker, the telework center worker, the electronic homeworker (continuous ICT contact with employer), traditional homeworker (only uses ICT to relay work outcomes to employer), nomadic worker, and professional worker (self-employed, consultant).

Illegems and Verbeke (2003) point to three main factors that influenced the adoption of telework during the 1970s. These factors include: the increased affordability of computers, the integration of telecommunications and data processing into one system,

and the interest in energy management in private and public transportation systems after the international oil crisis (Illegems & Verbeke, 2003). According to Illegems and Verbeke (2003), Alvin Toffler "envisioned that in the future, most workers would again work from their own house or cottage, as they had before the Industrial Revolution and its centralization of physical and human capital" (p. 17). Toffler (1980) coined telework the 'electronic cottage', which would solve issues of transportation waste and long commute times, as well as benefit family life (as cited in Illegems & Verbeke, 2003).

According to Sparrow (2000), the emergence of e-commerce was a primary driver of the *virtual economic organization*, which involved virtual work or telework. Sparrow (2000) describes the virtual economic organization as moving away from "the rigidity of electronic data interchanges" to "doing business that allowed information partnerships at every stage of the business process between customers, suppliers and companies" (p. 209). This change in how business was conducted, initially taken on by companies like Ford, General Motors, IBM and other Global 1000 corporations in the 1990s, transformed organizational structure (Sparrow, 2000).

When organizations first began to include telework as a work option for their employees, it was depicted as flexible work. According to Sparrow (2000) the depiction of telework differed from reality, as "there was a sense of one-sidedness to the initial move to alternative forms of work organization. The early acts of changing employment status were not based on the notion of mutuality in the exchange" (p. 212). Sparrow (2000) draws on the example of AT&T, a company that implemented telework to eliminate offices to reduce costs. While expense cutting was the primary motivation for organizations to incorporate telework, later it was driven by ideas of work quality, work

productivity, and work-life balance (Sparrow, 2000).

According to a 1998 cross-sectional attitude survey, conducted by an IT company in the UK with input from over 9,000 employees (56 percent response rate), it was found that 70 percent of employees viewed themselves as being mobile in their work (Sparrow, 2000). The study demonstrates the effect that mobile/telework has on the attitude of employees; 75 percent of employees felt increased productivity, 60 percent reported improved concentration, 66 percent felt that their morale was positively impacted by mobile/telework, 48 percent noted increased commitment to their employer, and 80 percent felt a positive effect on their work-life balance (Sparrow, 2000). This study also identifies how workplace pressures negatively affect employees; 62 percent reported feeling over-worked, 40 percent noted difficulty balancing work-life, 50 percent "felt drained" after work due to pressures, and a mere one third felt engaged in the education of their children (Sparrow, 2000). This data suggests that employees were dissatisfied, however it was found that only one third of employees would work from home over the next five years, as "more than half the employees felt that opting to telework for work-life balance reasons would lead their organization (or their co-workers) to question their commitment" (Sparrow, 2000, p. 213).

Sparrow (2000) describes the initial emergence of teleworkers in two types – the contract worker and the privileged core employee. Contract workers are "on flexible employment contracts, with portfolios of work across a variety of jobs, operating as enterprising free agents on a self-employed status" (Sparrow, 2000, p. 213). Privileged core employees are workers "enjoying high trust relationships, and given autonomy over work location and time" (Sparrow, 2000, p. 214). The next phase of integrating telework

into the workplace moved beyond token employees, who are contract workers or privileged core employees, and it is referred to as the virtual workplace. Townsend, DeMarie, and Hendrickson (1998) write, "This new workplace will be unrestrained by geography, time, and organizational boundaries; it will be a virtual workplace, where productivity, flexibility, and collaboration will reach unprecedented new levels" (p. 17). The virtual workplace prompted the formation of virtual teams, which are "geographically and/or organizationally dispersed coworkers that are assembled using a combination of telecommunications and information technologies to accomplish an organizational task" (Townsend et al., 1998, p. 18).

Technology Used in Telework

Scholars note a variety of problems that workers may experience when working at a distance. These include, "problems of temporal entertainment (Olson & Olson, 2000), lack of common ground (Cramton, 2001), difficulty in establishing interpersonal bonds (Kiesler & Cummings, 2002), inability to access important task related information (Wellman et al., 1996), and trouble recognizing and abating conflict (Hinds & Bailey, 2003)" (Leonardi et al., 2010, p. 87). Due to the many and varying difficulties teleworkers may experience, it is important to identify which ICTs are commonly being used, as well as how they are being used.

Telework exists due to the technologies that support the process. According to Leonardi et al. (2010), there are generally two classes of ICTs that are necessary for successful telework. These include, ICTs that support technological infrastructure, and software applications that enable communication within the infrastructure to occur. According to Timmerman and Scott (2006), teleworkers tend to employ a number of

different technologies that range from synchronous (i.e., audio conferencing) and asynchronous (i.e., e-mail and web pages) ICTs.

Managers often insist that teleworkers have a workspace that mimics that of a traditional office to promote productivity (Leonardi et al., 2010). Managers report that laptop computers and a reliable Internet connection are essential to a functional technological infrastructure (Leonardi et al., 2010). The four most important software applications, according to workers and managers, include: e-mail, voicemail, instant messaging, and virtual private networks (Leonardi et al., 2010). According to Lurey and Raisinghani (2001), virtual teams prefer to use e-mail, telephone, and voicemail more frequently than ICTs specifically designed for group interactions like conference calls, face-to-face meetings, groupware, and videoconferencing. Leonardi et al. (2010) found that email is the default communication technology for colleague and client communication. Voicemail is mainly used to communicate information created for a specific purpose, in an asynchronous manner, as well as to avoid delivering sensitive or urgent information online (Leonardi et al., 2010). Instant messaging services are used to communicate informally and synchronously – it is also used as "a back-channel for conservations during conference calls, or for simple questions that benefit form an immediate response" (Leonardi et al., 2010, p. 92). Virtual private networks are used to access company files, which may be sensitive, as well as crucial for the teleworker to complete their work (Leonardi et al., 2010).

Timmerman and Scott (2006) found that structure predictors (team size, number of member locations, number of member time zones, and organization type) influence the types of technologies used by teleworkers, which then affect team outcomes

(identification, cohesiveness, trust, and communication satisfaction). However, communication predictors (efforts to understand, argumentativeness, responsiveness, thoroughness and engagement, cultural/regional, trust, and connectedness) only affect team outcomes, not type of technology used (Timmerman & Scott, 2006). Communication variables, including responsiveness and thoroughness, and channel selection to maintain connectedness have been shown to have a strong correlation to virtual team outcomes, as "communication competence during team interactions can improve perception of effective group work" (Timmerman & Scott, 2006, p. 130).

Blount (2015) points to the importance of technology support for teleworkers. Blount (2015) writes, "Regardless of the sophistication of the ICT, technology support for employees who telework is crucial for productivity" (p. 88). Employees who did not feel that there was adequate technological support for telework chose to work from the central office, as "there isn't often a fall back position if technology fails" (Blount, 2015, p. 88).

Benefits and Disadvantages of Telework

This section will focus on the benefits and disadvantages of telework, as experienced by employees. Illegems and Verbeke (2003) identify five relevant areas for potential advantages and disadvantages of telework from an employee's perspective. These are; flexibility, work, work environment, social and professional interaction, and family.

Flexibility as an advantage is defined by "more flexibility, easier to access banks and public services, more flexibility in arranging personal free time, more flexibility to schedule" (Illegems & Verbeke, 2003, p. 118). Hill, Hawkins, Ferris, and Weitzman

(2001) explain that increased flexibility at work can reduce stress associated with the daily commute. Hill et al. (2001) write, "In a flexible environment, it is possible to schedule the commute at a time other than rush hour and thus reduce stress. In times of inclement weather, the flexplace employee may forgo the commute altogether" (p. 55). Flexible work arrangements like telework also permit employees to choose their living location, which may not be in the same city or country as their company (Hill et al., 2001). Flexible work is particularly beneficial for parents, as it aids in maintaining work-family balance (Hill et al., 2001). For example, parents may decide to sync their schedules to their school-age child's schedule to eliminate childcare services before and after school (Hill et al., 2001). Other scholars have pointed to the possibility of telework being a trigger for work-life imbalance, as professional and personal life become blurred within the walls of the home (Hartig et al., 2007 and Marsh & Musson, 2008, as cited in Morganson et al., 2008). This may be particularly true for individuals in demanding jobs as, "working from home may not allow workers to escape work, both mentally and physically" (Russell et al., 2009, as cited in Morganson et al., 2008, p. 580). Even though teleworkers tend to have more flexibility according to Illegems and Verbeke (2003), it was found that they often stick to regular working hours, which may be related to managerial expectations of teleworkers. According to Hill et al. (2001), flexibility at work demonstrated minimal benefit to managers due to the type of work and responsibilities associated with management positions, which could explain why some teleworkers choose not to deviate from regular working hours.

Work as a potential disadvantage is defined by isolation, miscommunication, less opportunity to advance career, more self-discipline required, and abuse by both the

employer and employee (Illegems & Verbeke, 2003). Cascio (2000) states that without sufficient social interaction with supervisors and colleagues "workers feel isolated and out of the loop with respect to crucial communications and contact with decision makers who can make or break their careers" (p. 83). Further, supervisors must be able to trust employees who work virtually; otherwise the arrangement will likely fail regardless of training and performance management (Cascio, 2000).

Cramton's (2001) study on miscommunication in dispersed collaboration focuses on mutual knowledge, which is the shared information between two or more parties. According to Cramton (2001), consequences of not establishing mutual knowledge are; failure to communicate and retain contextual information (i.e., details about the contexts in which their distant counterparts work), unevenly distributed information (i.e., not sharing the same information with all team members, whether this be knowingly or unknowingly, and not understanding the consequences of this action), difference in the salience of information (i.e., difficulty explaining to partners what part of messages or messages are the most important), relative differences in speed of access to information (i.e., asynchronous communication may result in some team members conversing regularly and others less regularly), and interpretation of the meaning of silence (i.e., misinterpreting why team members fall silent due to barriers of communication technology and geography dispersion). Mutual knowledge may be important to consider when examining how information communication technology affects interpersonal communication between colleagues. Hinds and Bailey (2003) state that the most effective way to resolve conflict resulting from distance work and use of communication technologies is to remove the distance for a period of time. To accomplish this Hinds and

Bailey (2003) suggest "increasing the frequency and length of face-to-face meetings […] Because face-to-face interaction facilitates interpersonal relationships, more face-to-face meetings should promote more familiarity and friendship" (p. 625).

The potential advantages of work are higher productivity, more autonomy, and less work stress (Illegems & Verbeke, 2003). According to Illegems and Verbeke (2003), teleworkers can get up to 60 percent more work done than conventional workers - this increase in productivity can be explained by fewer interruptions and working longer hours. However, Bailey and Kurland (2002) write, "Accounts of increased productivity under telework are derived from self-report data. Because most teleworkers volunteer or request to work at home, they might be biased to claim success" (p. 389). Westfall (2004) is also skeptical about the claims that state telework increases productivity, as evidence is largely anecdotal. Westfall (2004) suggests employers' record data that demonstrates the amount of work (hours of work per day or week), intensity of work (how hard employee is working), efficiency of work (ratio of outputs to labor inputs) and adjustments (added costs associated with telework). In addition, scholars warn that teleworkers are prone to overworking themselves, as they have been found to work or be available after hours and on sick or vacation days (Blount, 2015). "Highly-skilled employees with high job responsibilities (a type of employee likely to adopt telework) are used to working uncompensated overtime at home. Telework schemes will be particularly attractive to employees who are comfortable working alone" (Illegems & Verbeke, 2003, p. 119). In examining autonomy and telework, Gajendran and Harrison (2007) suggest that perceived autonomy is strongly connected to job satisfaction and is somewhat connected to ratings of performance, turnover intent, and role stress. Scholars suggest that telework

does not enhance autonomy as employers may require performance contracts and electronic activity monitors for telework arrangements, which impede perceived control (Gurstein, 2001; Shamir & Salomon, 1985; Harrison, Johns, & Martocchio, 2000, as cited in Gajendran & Harrison, 2007).

Work environment has the potential to be advantageous to teleworkers as it allows for more working space, and less need to conform to office norms like dress codes (Illegems & Verbeke, 2003). However, work environment can also result in disadvantages such as not having the appropriate equipment to complete one's job, and may have a negative influence on the organizational culture (Illegems & Verbeke, 2003). Fonner and Roloff (2010) found that exposure to organizational politics (often present in the work environment) have an effect on job satisfaction for teleworkers. It was noted that high-intensity teleworkers are less likely to perceive that political behavior among coworkers is widespread within the organization, and therefore are less likely to believe that coworkers participate in political behaviors to reap professional benefits (Fonner & Roloff, 2010). Fonner and Roloff (2010) state, "Decreased face-time in the office affords a distinct advantage by limiting teleworkers' exposure to political behavior, or at least allowing them to feel removed enough to downplay its prevalence" (p. 354). Telework allows individuals to avoid everyday organizational politics, which increases job satisfaction, as politics in the workplace have been associated with job neglect and turnover intentions (Vigoda, 2003, Cropanzano et al., 1997, as cited in Fonner & Roloff, 2010).

Similarly, *social and professional interaction* in telework can have a negative influence on the organizational culture, as there is less opportunity for these types of

interactions (Illegems & Verbeke, 2003). Social isolation is one of the main psychological issues experienced by teleworkers. "Most people need human contact, and there is no perfect substitute for the stimulation, immediate feedback and fun of exchanging ideas face-to-face with other people" (Illegems & Verbeke, 2003, p. 121). According to Cooper and Kurland (2002), professional isolation can affect employee development. Employee development can be formal, achieved through workshops and training, or informal, achieved through normal day-to-day work activities (Cooper & Kurland, 2002). Cooper and Kurland (2002) highlight three types of employee development: interpersonal networking, informal learning, and mentoring. "When employees work off-site, they miss informal interactions that occur in the workplace (Kugelmass, 1995; Piskurich, 1996). Interpersonal networking can exist in various forms, including office gossip and work-related, spontaneous discussions (Kurland & Pelled, 2000)" (Cooper & Kurland, 2002, p. 513). These interactions provide access to relationships and information that can benefit their career (Cooper & Kurland, 2002). Informal learning allows employees to interact face-to-face with others to exchange data and help to "build one's knowledge base" (Cooper & Kurland, 2002, p. 513). According to Cooper and Kurland (2002), "Informal interaction enables employees to negotiate an organization's political infrastructure and informal learning further develops the employee's expertise, mentoring does both" (p. 513). A mentor benefits both the employee and the organization, as they "act as role models, encourage new behaviors, provide feedback, counsel, and facilitate informal exchanges of information about work and non-work experience" (Kram, 1985, as cited in Cooper & Kurland, 2002, p. 513).

Family in telework has the potential to alleviate some of feelings of isolation, as

well as the opportunity to spend more free time with family and friends (Illegems & Verbeke, 2003). While there are benefits to being able to spend more time with family and friends, a home environment in telework can result in distractions and conflict with individuals in these relationships, if there are not clear boundaries between professional and personal life (Illegems & Verbeke, 2003). Illegems and Verbeke (2003) reference Mirchandani (1999):

> […] Many homeworkers use rituals to preserve the distinction between professional and family life. Homeworkers create their own spatial boundaries (a room or a designated area as an office), or their own temporal, behavioral or psychological boundaries (e.g., regular work schedules, or dressing differently when working versus relaxing) (p. 122).

Communication in Engineering

This section will focus on the role of communication in the field of engineering. It is important to include this section, as communication processes may vary from one profession to another. As this research project is investigating the effect of ICTs on interpersonal communication in engineering contexts, it will be helpful to further understand the communication processes specific to this type of work.

Darling and Dannels (2003) examine the importance of oral communication for practicing engineers. Darling and Dannels (2003) state that engineers spend more than half of their day communicating with colleagues they are working with on projects or with individuals outside the organization. Therefore, organizations such as The National Board of Engineering Education, suggest that the engineering curriculum should focus more attention on instruction in communication (Darling & Dannels, 2003). Darling and

Dannels' (2003) study found that practicing engineers ranked oral communication as the most important skill; one participant wrote, "100% - communication is life blood" (p. 15). Darling and Dannels (2003) add, "Researchers, industry representatives, accreditation agencies, and faculty around the country are offering overwhelming agreement to this statement" (p. 15).

Lappalainen's (2009) study on communication as a key skill for engineers writes, "Engineers no longer manage their daily tasks with plain substance expertise; instead they must be adept at communication, collaboration, networking, feedback provision and reception, teamwork, lifelong learning, and cultural understanding" (p. 123). This statement is in line with other studies that suggest the modern workplace has shifted and evolved in recent years. Williams, Muller, and Kilanski (2012) support this claim; as they explain that the new economy is defined by job insecurity, work teams, career maps, and networking. This is in contrast to the traditional workplace, which was defined by job loyalty, standardized job descriptions, career ladders, and manager-controlled environments (Williams et al., 2012). Lappalainen (2009) highlights the importance of communication skills in three main areas of engineering. These include: strategy creation, strategy implementation, and working culture. Communication skills tied to work culture provide relevant information for this study as they highlight the link between effective communication and feedback, and how this link is necessary to boost workplace morale.

These studies demonstrate the important role communication plays in engineering. As stated above, practicing engineers rely upon sound communication skills for communicating ideas in teamwork, which is a core component of the job. It is important to note that communication plays an essential role in the everyday work of engineers, as

those engineers who telecommute will be required to fully engage with information communication technologies in order to be successful. This makes engineering and telework an important site of analysis.

Importance of Workplace Relationships

Jacob et al. (2008) write, "It is more challenging than ever to manage effectively – to recruit top talent, to engage and retain this talent, and to maximize productivity – in the face of fierce competition, more complicated jobs, and changing workforce demographics" (p. 141). Keeping these challenges in mind, Jacob et al. (2008) reference six important factors that contribute to an effective workplace. These factors include: job autonomy, learning opportunities, supervisor support for job success, coworker team support for job success, involvement in management decision-making, and workplace flexibility. Although all of these factors are important in creating an effective workplace, literature on coworker team support is particularly relevant when examining the link between ICTs and workplace relationships.

According to Kram and Isabella (1985) there are three types of workplace relationships. These include: the information peer, collegial peer, and the special peer. The information peer is primarily focused on exchanging information about their work and the organization – it is associated with low levels of self-disclosure and trust, as well as limited emotional support due to the infrequency of the exchange. The collegial peer has a moderate level of trust and self-disclosure, and provides some emotional support, feedback, and confirmation for others. The special peer, according to Kram and Isabella (1985) is the "most intimate form of peer relationship," as high levels of self-disclosure and self-expression are revealed – intimacy, confirmation, and stability are key

components of this type of relationship (p. 119).

Ducharme and Martin (2000) highlight that "job demands and pressures, job complexity, role over-load, decision latitude, oppressive or unpleasant working conditions, and physical effort" can lead to poor psychological and behavioral health, which affect an individual's work and home life (p. 224). Two types of social support were identified: affective (personal affiliations) and instrumental (functional interdependence of workgroup members) (Ducharme & Martin, 2000). Major et al. (1995) found that relationships with supervisors were more important for job satisfaction than relationships with coworkers, especially when employees are first hired. In a telework context, organizational social support (supervisor, co-worker and organizational support) has been found to positively impact job satisfaction (Bentley et al., 2016). "Organizational social support was found to have the greatest influence on job satisfaction for low intensity teleworkers, presumably because hybrid teleworkers were already high in satisfaction due to the known benefits of the telework role" (Bentley et al., 2016, p. 213). Further, employees tend to be highly satisfied with their jobs when the organization promotes and encourages the importance of workplace relationships (Ducharme & Martin, 2000, as cited in Crabtree, 2004). In addition, higher levels of autonomy and skill development are related to the greater number of work teams an employee is part of, as "multiple team memberships may complement traditional hierarchies and enable workers more control" (Chen & McDonald, 2015, p. 502).

Another important concept to consider is the sense of community a person may experience in an organization. McMillan and Chavis (1986) define sense of community as, "A feeling that members have of belonging, a feeling that members matter to one

another and to the group, and a shared faith that members' needs will be met through their commitment to be together" (p. 9). McMillan and Chavis (1986) propose four elements that make up sense of community, which include: membership, influence, reinforcement, and shared emotional connection. The first element refers to membership as a feeling of belonging, which is characterized by boundaries (McMillan & Chavis, 1986). These boundaries dictate who is a part of the community and who is not, and this can be seen in representations of those boundaries (McMillan & Chavis, 1986). According to McMillan and Chavis (1986), "Groups often use language, dress, and ritual to create boundaries" – all of which are markers of group identity (p. 9). Blanchard and Markus (2004) examined membership in the virtual sense of belonging in the context of an online group for people participating in or training for sports events. Their findings show that membership was developed by members creating their identity from within the group as well as the members' ability to identify with others in the group. Blanchard and Markus (2004) write, "We observed emerging members creating identities that would be accepted by the group, and we observed the more established participants and leaders trying to distinguish themselves from the group" (p. 75). This differs from the findings from McMillan and Chavis (1986), which state that community is a sharing of one group identity (Blanchard & Markus, 2004). Blanchard and Markus (2004) attribute the contrast between group identity and individual identity to the anonymous nature of the online communities, "It may be psychologically necessary to establish oneself as a distinct someone in a virtual community" (p. 75).

The second element is influence, which is described as the attraction to a group based on the individual's influence within that group, or the group's ability to influence

its members (McMillan & Chavis, 1986). As influence presents two binary forces, McMillan and Chavis (1986) ask whether it is negative for a group to exert members into conformity. When conformity is consensual, "uniform and conforming behavior indicates that a group is operating to consensually validate its members as well as to create group norms" (McMillan & Chavis, 1986, p. 11). This suggests that conformity requires a moderate level of "fit" between an individual and a group in order for an individual to buy into group norms.

The third element is integration and fulfillment of needs, which is defined as reinforcement, "For any group to maintain a positive sense of togetherness, the individual-group association must be rewarding for its members" (McMillan & Chavis, 1986, p. 12). Some factors that affect reinforcement are the status of being a member, and the competence of group members, as being in close proximity to those with similar or greater competence can be beneficial for the member (McMillan & Chavis, 1986).

The fourth element is shared emotional connection, which is based on a shared history. According to McMillan and Chavis (1986), while it is not necessary that others be physically present during past experiences with members, it is important that they identify with it. This is thought to strengthen bonds within the community. The theory of sense of community proposed by McMillan and Chavis (1986) is of value as it draws attention to how perceptions of belonging are formed within groups, which is thought to be essential to a functioning workplace (Major et al., 1995).

In contrast to the work of McMillan and Chavis (1986), Blanchard and Markus (2004) found that three social processes are responsible for creating a sense of virtual community (SOVC). These processes are: exchanging support, creating and making

identification, and trust (Blanchard & Markus, 2004). Blanchard and Markus (2004) write, "Exchanging informational and emotional support is the impetus for community formation. But members must trust the support they receive, and trust requires belief in the support-givers' identities" (p. 76). Blanchard and Markus (2004) state that each virtual community may have unique characteristics of SOVC, however due to the reliance on electronic communication in virtual communities, individuation of identity and relationships are likely to be more important than in physical communities.

Theories about sense of community and virtual sense of community will be useful when examining workplace relationships in the context of telework. These studies draw attention to an important question in telework – are teleworkers part of a virtual community? If so, how can researchers determine this? As teleworkers are theoretically employees of a physical workplace, it is possible that they are part of both virtual and non-virtual communities. This divide between communities may pose challenges, specifically in areas of belonging and trust.

These studies are significant to this research project as they emphasize the importance of workplace relationships on work outcomes, such as job satisfaction, engagement, and retention. As telework implies physical separation, it is important to consider how coworker team support in telework can be implemented to sustain positive work outcomes.

Workplace Relationships and Telework

A study by Sias et al. (2012) examines how workplace friendships are formed using information communication technology in telework. It was found that personality, similarity, and shared tasks were key factors in friendship initiation (Sias et al., 2012). It

was established that ICTs provide sufficient means for gaining insight into coworkers' personalities and backgrounds, however as employees spent more time telecommuting, personality became increasingly less important in friendship initiation (Sias et al., 2012). Sias et al. (2012) write, "The lack of social presence does somewhat hinder employees' abilities to learn about one another's personalities or perhaps renders personality less important" (p. 272). Additionally, the more time workers spent telecommuting, the more essential shared tasks became in friendship formation (Sias et al., 2012). Interestingly, physical proximity was rated the least important factor in friendship formation, which indicates that when technology is used properly, meaningful relationships can be formed (Sias et al., 2012). Technologies that are preferred for coworker communication within telework, include telephone, e-mail, and texting, while teleconferencing, social networking, instant messaging, and paper documents were less preferred (Sias et al., 2012).

Huff, Sproull, and Kiesler (1989) reference Mowday, Steers, and Peter's (1979) three aspects of organizational commitment, "a belief in the organization's goals and values, a willingness to exert considerable effort to help the organization, and a strong desire to maintain membership in the organization" (p. 1372). According to Huff et al. (1989), computer communication between shift workers who are separated by time can increase feelings of commitment to an organization; however, telephone and memo communication did not have the same effect. Huff et al. write, "They are isolated temporally from other workers, and an asynchronous medium of communication offers them the possibility of transcending that temporal isolation in a mode of communication that is personal and informal" (p. 1386). Computer communication offers "informality,

ease of interaction, and asynchrony," all of which are important when working from a distance (Huff et al., 1989, p. 1384). Huff et al. (1989) hypothesize that this finding was due to access to information, which led to increased commitment, or active participation in the communication network, which produced commitment. Communication mode did not affect employees' sense of being informed; however active participation in the communication network was found to be a predictor for commitment (Huff et al., 1989). This finding is important as it provides evidence that shows workplace relationships can increase organizational commitment, and further, that these relationships can be maintained through information communication technology.

Fay and Kline (2011) found that informal communication was essential for workers to develop feelings of attachment for each other and their organization (Fay & Kline, 2011). Informal communication can be seen as a way to ensure work outcomes, including organizational commitment and organizational engagement (Fay & Kline, 2011). Fay and Kline (2011) suggest that managers create opportunities for their teleworking employees to communicate with each other in an informal manner in order to achieve these outcomes.

Picherit-Duthler, Long, and Kohut (2004) examine the socialization of newcomers in virtual teams. It was found that the duration of the team and the formation of the team were significant factors in whether or not a newcomer would be successfully integrated into the virtual community. Picherit-Duthler et al. (2004) explain that work team stability was essential to socialization, as individuals who perceive their position as temporary are less likely to be loyal to the organization and the work team. Larvenpaa and Leidner (1999) found that high levels of initial trust were contingent on having: initial

communication, ongoing communication on task and social information, proactive orientation, positive tone, task goal clarity, role division and specificity, time management, substantial feedback on work, and frequent communication with peers and supervisors (as cited in Picherit-Duthler et al., 2004). Picherit-Duthler et al. (2004) write, "Organizations have to create ways for team members to experience membership by being explicit about the team's norms, roles, and purposes" (p. 123). In doing so, new team members should be able to understand what is expected of them and feel at ease when entering the team (Picherit-Duthler et al., 2004).

Team formation can also play an important role in the socialization process of virtual teams. According to Picherit-Duthler et al. (2004), when there is little knowledge about team members' abilities, limited mutual workplace identity, and lack of commitment to maintaining a future relationship, team trust and communication is negatively impacted. Picherit-Duthler et al. (2004) write, "One implication may be that team members are less willing to initiate conversations and volunteer information" (p. 123). Literature on team duration and team formation is important to consider when examining how virtual workplace relationships function.

The literature referenced in this section is significant to this study as it highlights why workplace relationships are important, especially in telework where feeling isolated from peers is common. Although these studies point to telework as a barrier for relational support, this is not to say that ICTs cannot allow for such support when used effectively. These studies suggest that perhaps teleworkers are not being adequately equipped with the appropriate resources to initiate and engage in workplace relationships.

Belonging and Isolation

To better understand how teleworkers gain a sense of belonging to an organization it is important to examine the ways in which individuals transition into virtual work. This section will explore the concepts of organizational identification, organizational belonging, and isolation.

Raghuram et al. (2001) define how employees adjust to virtual work based on structural factors (i.e., work independence and evaluation criteria) and relational factors (i.e., trust and organizational correctedness). According to Raghuram et al. (2001) structural factors can alleviate challenges associated with virtual work. Work independence, as a structural factor, allows employees to work from different locations with the use of information communication technologies such as e-mail and cell phones (Raghuram et al., 2001). By leaving behind the traditional office setting where employees work "in an assembly line fashion," a sense of interdependence is formed (Raghuram et al., 2001, p. 385). Raghuram et al. (2001) explain interdependence as the process "whereby individuals can work autonomously at an individual level without having to sacrifice the benefits of collaboration at a collective level" (p. 385). Raghuram et al. (2001) state that online collaboration via communication technology positively affects work independence. Another structural factor that aids in the transition to virtual work is clarity of evaluation criteria. As teleworkers often have less opportunity for feedback from their colleagues and supervisors, a clear criterion of evaluation "is key for generating feedback that can guide and reinforce the performance of virtual workers" (Raghuram et al., 2001, p. 386). A lack of understanding about evaluation criteria can cause "virtual workers to inadvertently pursue inappropriate goals that undermine their

performance and consequently diminish their organizational relationships" (Raghuram et al., 2001, p. 386).

Raghuram et al. (2001) discuss how relational factors may also be associated with adjustment to virtual work. Interpersonal trust is the "expectations, assumptions, or beliefs about the likelihood that another's future actions will be beneficial, favorable, or at least not detrimental to one's interests" (Frost, Stimpson & Maughan, 1978; Gambetta, 1988, as cited in Raghuram et al., 2001, p. 387). Trust within the workplace is important as research suggests that trust reduces anxiety about work-related worries (Ryan & Oestreich, 1998, as cited in Raghuram et al., 2001, p. 387). Another important relational factor is organizational correctedness, which is "the extent to which individuals perceive that they are central to, visible in and involved with the organizational community" (Raghuram et al., 2001, p. 387). Maintaining organizational correctedness may be challenging in telework as interactions between colleagues and supervisors is often limited – "without it [interaction], workers feel isolated and out of the loop with respect to crucial communications and contact with decision makers who can make or break their careers" (Cascio, 2000, p. 82-83). Raghuram et al. (2001) warn organizations against inadequate preparation of structural and relational factors in virtual work arrangements, as employee adjustment may be negatively affected. Without successful adjustment to virtual work, employees may not feel a sense of organizational belonging.

According Ashforth, Harrison, and Corley (2008), organizational identification generally encompasses concepts of attachment such as "organizational commitment, organizational loyalty, person-organization fit, psychological ownership, and job embeddedness" (Ashforth et al., 2008, p. 332). Scholars define organizational

identification as, "a sense of stability and security for individuals through the development of self-concept orientations in relation to others, and their legitimacy as members of the organization" (Cooper & Thatcher, 2010; Zagenczyk et al., 2011, as cited in Belle et al., 2015, p. 89). While organizational commitment refers to a favorable attitude toward the organization, organizational identification refers to "a perceived oneness with the organization, necessarily implicating one's self-concept" (Ashforth et al., 2008, p. 333). Organizational identification is beneficial to work outcomes, which include cooperation, effort, participation and decision-making, task performance and information sharing, as well as coordinated action (Ashfort et al., 2008). A study by Van Dick et al. (2004) found that organizational identification is associated with turnover intentions, which is due to the effect identification has on job satisfaction. Identification management strategies include, "Stressing the organization's identity by highlighting the common goals, mission and unique culture of the organization" (Knippenberg, 2003, as cited in van Dick et al., 2004, p. 357). Another strategy to strengthen identification is to compare the organization with a competitor, as "this would threaten the organization's prestige and should increase salience and subsequently identification with the organization" (van Dick et al., 2004, p. 358).

Burley, and Long (2015) found that identity was key to understanding how belonging develops for high intensity teleworkers. Identification develops on both an individual level and an organizational level. On the individual level, it was found that individuals identified with those who shared the same social or leisure interests, as well as those who acknowledge daily activities from their personal lives (Belle et al., 2015). On the organizational level, individuals referenced the importance of "alignment between

organizational and personal principles and ideals such that there is not a tension that hinders fit" (Belle et al., 2015, p. 88).

Belonging was also developed on both an individual level and an organizational level. Belle et al. (2015) define organizational belonging as, "experiencing an acknowledgement of one's talents, interests, and experiences, and finding whole acceptance of one's self-expression of these" (p. 90). Individually, feeling included was indicative of having a supervisor or colleague include them in conversations, as well as feeling as though their opinion was welcome and encouraged within these conversations (Belle et al., 2015). Organizationally, feeling included was associated with fulfilling the administration and communication needs of teleworkers, which includes providing options that allows them to participate in work activities, to avoid having them feel forgotten (Belle et al., 2015).

According to Belle et al. (2015), there are three ways that high intensity teleworkers can achieve organizational belonging. The first way is through *choice* (Belle et al., 2015). Belle et al. (2015) explain that individuals choose to telecommute based on the perceived benefits, which include flexible work location, greater work-life balance, and finding fulfilling work in an organization that favors telework. "Faced with the prospect of losing the flexibility of high-intensity telework, participants shared that they would seek another opportunity or organization where high-intensity telework was available" (Belle et al., 2015, p. 90). The second way to achieve organizational belonging is through *negotiation* (Belle et al., 2015). Belle et al. (2015) suggest that teleworkers employ strategies to ensure that the work arrangement meets their needs as well as the organization's needs. This may be done through "agreeing to schedule adjustments, deciding on expectations

for remaining responsive during work assignments, and discussing with managers a modification of their roles" (Belle et al., 2015, p. 90). The third way is that of *knowing*. Knowing refers to "knowing how to be, knowing how the organization works, and understanding others" (Belle et al., 2015, p. 90). The concept of knowing was linked to learning what level of belongingness was important for "professional success and personal fulfillment" (Belle et al., 2015, p. 90). Additionally, knowing was linked to having power, in the form of action and influence, as well as confidence (Belle et al., 2015).

Mann, Varey, and Button (2000) examine the negative emotional impact that telework can have on employees. Two relevant impacts mentioned within this study, included isolation and lack of support. According to Mann et al. (2000), a number of participants expressed feeling isolated from other employees (Disadvantages of teleworking, para. 1). Mann, Varey, and Button (2000) write, "The participants suggested that we look to others to give us some idea of how we ought to be behaving – we use other people as social barometers" (Disadvantages of teleworking, para. 1). Mann et al. (2000) suggest that the lack of FtF interaction can also prevent employees from meeting future partners or friends through work events or activities (Disadvantages of teleworking, para. 2). In these examples, confirmation from others and a sense of belonging is jeopardized. Additionally, participants felt a lack of technical and emotional support from others within the company (Mann et al., 2000, Disadvantages of teleworking, para. 6). A lack of technical support for computers or work assignments can leave workers feeling "worried, panicky, frustrated or even fearful" (Mann et al., 2000, Disadvantages of teleworking, para. 7). Other participants mentioned missing the

emotional support from coworkers within a traditional office setting (Mann et al., 2000, Disadvantages of teleworking, para. 7). Bentley et al. (2016) found that teleworker support (technology support, manager support for telework) was only slightly related to reduced feelings of psychological strain, as "many wellbeing enhancers associated with telework are independent of organizational factors such as manager support and technology support, including reduced commute time and stress, reduced travel costs, increased non-work time, and the restorative benefits of working in the home environment" (Bentley et al., 2016, p. 213).

Golden, Veiga, and Dino's (2008) study examines professional isolation in telework and the effect it has on job performance and turnover intentions. According to Diekema (1992), professional isolation is "a state of mind or belief that one is out of touch with others in the workplace" (as cited by Golden et al., 2008, p. 1412). It was found that professional isolation in telework negatively impacted job performance, even though telework is often thought to allow workers to be more productive (Golden et al., 2008). Those who spent more time teleworking and less time engaging in face-to-face interactions experienced their job performance being negatively impacted (Golden et al., 2008). Telework has also been positively related to depression due to less face time with colleagues and supervisors, less career development opportunities, and teleworkers being perceived as less committed to their company compared to traditional employees (Campione, 2008). Surprisingly, it was found that teleworkers who experienced greater professional isolation expressed less desire to leave their job (Golden et al., 2008). Golden et al. offer an explanation for this finding, "Perhaps, as a consequence of greater professional isolation, teleworkers simply begin to lose faith in their skills and knowledge

and in their ability to find alternatives?" (p. 1418).

Uses and Gratifications Theory

Uses and gratifications theory (U&G) is used to explain why users choose a particular communication channel and message, and examines the interpretation, response and impact of this selection (Rubin, 2009). U&G believes that users actively engage with media and that they make rational decisions to determine which type of media will fulfill their personal needs and values (Dainton & Zelley, 2011). McQuail (as cited by Dainton & Zelley, 2011) identified four overarching motivations that influence users' choice in media. These include: entertainment, information, personal identity, and personal relationships and social interaction. These motivations can be categorized as being ritualized (for diversion) or instrumental (for goal-oriented outcomes) (Rubin, 2009). While literature on U&G is primarily centered on traditional types of media (television, newspaper, radio, etc.), in the last decade scholars have shifted to focus on new media in the context of U&G.

New media welcomes interactivity, demassification, and asynchroneity, characteristics not found in traditional media (Ruggiero, 2000). An understanding of interactivity is perhaps most relevant to this study as it applies to new media. According to Ha and James (1998) interactivity is "the extent to which the communicator and the audience respond to each other's communication need" (p. 457). Ha and James (1998) state that audience members have varying needs for internet use. For example, "Sometimes, the audience wants immediate assistance from a company, such as technical support information to solve a problem" (p. 461). Based on this understanding, five dimensions of interactivity were developed. These include: playfulness (a voluntary

escape from task), choice (unrestrained navigation of the internet), connectedness (the feeling of being connected to the world), information collection (gathering data), and reciprocal communication (two way communication) (Ha and James, 1998). A similar concept was proposed by Heeter (1989), which identified choice, effort, medium responsiveness, system use monitoring, information input accessed by a wide audience, and interpersonal communication between users, as key characteristics of interactivity (as cited by Ruggiero, 2000).

Recent studies have examined whether more interactive media is gratifying to its users. Wang, Tchernev, and Solloway (2012) found that social media (social networking sites, tools for communication, and sites for information) use is prompted by all four U&G needs (emotional, cognitive, social, and habitual), while other media (television, newspaper, etc.) is prompted by emotional and social needs. However, social media was only perceived to be socially gratifying, as users reported not actually feeling socially gratified (Wang et al., 2012). In contrast, Steinfield, Ellison and Lampe (2008) found that social networking sites (Facebook) have the ability to influence social capital (i.e., benefits received from social relationships). Steinfield et al. (2008) write, "Facebook, along with other online social network services, plays a role by facilitating the maintenance of close friendships and the distance relationships that help create bridging social capital" (p. 443). Malik, Dhir, and Nieminen (2016) found that photo sharing on the social networking site, Facebook, is motivated by a desire for popularity and attention within peer groups and larger social circles. In another study, Stafford, Kline and Dimmick (1999) found that gratifications of email are important in the use of email at home. Maintenance of interpersonal relationships was found to be a significant

gratification of email choice (Stafford et al., 1999).

Shifting towards research conducted using U&G in organizations; Danowski (1980) argues that professionals base communication on three main content categories. The first is production, which refers to completing the work, instructing on task, minimizing mistakes, and meeting deadlines (Danowski, 1980). The second is innovation, a reference to finding new ways to accomplish new tasks, new information sources, and new channels to communicate (Danowski, 1980). The third is maintenance, which refers to dealing with the problems of others, interpersonal communication, monitoring behavior, resolving arguments, and offering counseling (Danowski, 1980). Organizational studies have found support for the theory. Dobos (1992) found that media selection in organizations is based on evaluations of media performance by the organization as a whole, which is not predictive of U&G. Dobos (1992) writes, "Choice making appears to be influenced by organization wide perceptions of the communication functions served by various channels" (p. 45). However, it was also found that when a media provides more gratifications, satisfaction increases for communication technology but not for face-to-face meetings or written memos (Dobos, 1992). Steinfield (1986) found that email was linked to both task and social use. Task use is dependent on the perceived gratifications of the media, which were "access to relevant others via electronic mail, and access to terminals" (Steinfield, 1986, p. 800). In addition, task use for email increased for geographically and organizationally dispersed coworkers who needed to communicate in a timely and accurate manner.

According to Ruggiero (2000), there are five main criticisms about more recent U&G research. The first, U&G is centered on audience consumption, which is often

specific to the individuals studied as opposed to larger groups or societies. Secondly, studies tend to produce a number of typologies for motives, which do not line up with other studies. Third, the central concepts such as "social and psychological backgrounds, needs, motives, behavior, and consequences" lack clarity (Ruggiero, 2000, p. 12). Fourth, researchers attribute a variety of reasoning for the motives, uses, and gratifications, therefore "contributing to fuzzy thinking and inquiry" (Ruggiero, 2000, p. 12). And finally, the ideas of active audience and the validity of self-report data are thought to be under developed. Ruggiero (2000) writes, "Self-reports may not be measuring the individual's actual behavior so much as his or her awareness and interpretation of the individual's behavior" (p. 12). These criticisms will be taken into consideration when examining U&G in the context of this study.

Media Richness Theory

Media richness theory proposes that media use affects how users communicate. Media richness is determined by evaluating four characteristics: speed of feedback, ability to personalize the message, availability of multiple cues, and language variety (Dainton & Zelley, 2011). Based on these factors a medium can be labeled as rich or lean. According to Daft and Lengel (1983), face-to-face communication is the richest form of information processing because it allows for multiple cues (body language, facial expression and tone of voice) and immediate feedback. Video conferencing and telephone are also thought to be rich media forms, whereas written communications, such as instant messaging, e-mail and letters, are less rich. These being asynchronous technologies, visual and audio cues are limited and feedback is not immediate (Dainton & Zelley, 2011).

According to Daft and Lengel (1986), organizations process information to reduce uncertainty and equivocality. Uncertainty refers to the amount of information needed to minimize uncertainty related to task (Daft & Lengel, 1986). While equivocality "presumes a messy, unclear field. An information stimulus may have several interpretations. New data may be confusing, and may even increase uncertainty" (Daft & Lengel, 1986, p. 554). Face-to-face media was found to be the preferred media for managers when messages contained equivocality, while written media were preferred when messages did not contain equivocality (Lengel & Daft, 1984 as cited in Daft & Lengel, 1986). Due to richer media allowing for multiple cues and immediate feedback, it is thought that users of rich media would perform better for equivocal tasks (Lengel & Daft, 1986).

Media richness theory is subject to a number of criticisms. Walther and Parks (2002) state that the four characteristics of richness lack clarity as to how they interact with one another. "It is not clear how or whether changes in cue multiplicity, immediacy of feedback, message personalization, and linguistic form might be related to one another" (p. 534). The example of email is referenced as lacking immediate feedback but as having the capability to personalize language (Walther & Parks, 2002). Walther and Parks (2002) also state, "Communicative efficiency may rest on sequences or combinations of media rather than on isolated choices about a single medium" (p. 534). For example, an individual may choose to begin a difficult conversation via email prior to a face-to-face conversation (Walther & Parks, 2002). However, Dennis and Kinney (1998) claim that studies critiquing media richness theory often examine media choice, as opposed to media use. Studies may "fail to examine the central proposition of media

richness theory as proposed by Daft and Lengel (1986). Does the use of richer rather than leaner media for equivocal tasks improve actual performance?" (p. 258). With that said, Dennis and Kinney (1998) did not find support for the theory using new media."The media itself had no significant effect on decision quality, consensus, and communication satisfaction" (Dennis & Kinney, 1998, p. 269). Dennis and Kinney (1998) further state, "We conclude that matching media richness to task equivocality does not improve performance for the new media" (p. 269). While there may be a lack of support for media richness relative to task equivocality and improved performance, a number of studies have used media richness to examine media use in a more general sense.

Walter, Ortbach, and Niehaves (2015) examined human and non-human supervisor feedback using ICTs and discovered heightened levels of social presence in the feedback delivered using video compared to audio, and audio compared to text. "These results supported our expectations that richer feedback media, due to its ability to convey more social cues, is able to increase the perception of social presence" (Walter et al., 2015, p. 9). Webster and Trevino (1995) examined how social and rational explanations can affect media choice. In terms of rational explanations (i.e., situational determinants and content message), the distance between communication partners was found to be associated with media choice – preference was for e-mail, memos, and letters, and less preference was for face-to-face meeting (Webster & Trevino, 1995). In addition, message equivocality influenced media choice, except for memos – preference was for face-to-face meeting (Webster & Trevino, 1995). Conrath (1973) found that face-to-face communication was often used by workers located in close proximity and who worked together on shared tasks. The only time workers used written media was when

documentation was needed (Conrath, 1973). The opposite was true for communication between workers over distance, "The written mode was roughly equivalent to the telephone for both task and authority structures, and yet written communication was used relatively more frequently over short distances" (Conrath, 1973, p. 599). These findings are inline with the work of Rich and Shook (1990) who found that high level managers were more likely to use email. "Electronic mail should not be compared to media such as memos and letters, the least information-rich media, but rather to the telephone, which is generally placed in the middle of information richness/social presence scales" (Rich & Shook, 1990, p. 220). This may offer an explanation as to why distance workers prefer to use less rich media at work, as found in the studies by Webster and Trevino (1995) and Conrath (1973).

A more recent study by Higa et al. (2000) found that social influence in the form of management support was predictive of email media use by teleworkers. While teleworkers had a rational opinion about the information richness of email, the social structure of the work environment was influential in its use (Higa et al., 2000). In addition, it was found that management support and perception of email richness were associated with email productivity (Higa et al., 2000). "They felt that email increased productivity when it could carry rich information, and when there was support from management and supervisors for its use" (Higa et al., 2000, p. 170). This study suggests that when email is perceived to be an information rich media, it's "functional diversity and richness" could actually improve teleworkers' productivity (Higa et al., 2000, p. 170).

Chapter 3: Methodology

Research Design

A phenomenological research design was the most appropriate choice for this study, as it allowed the researcher to delve into the lived experience of the participants. In this study, the goal was to understand how ICT used in telework affected communication and perceptions of isolation for engineering professionals. Essentially, the researcher was seeking to understand how different individuals from similar professional backgrounds experienced the phenomenon of telework. In this context, a phenomenological approach was the most effective method to explore the lived experiences of teleworkers.

According to Creswell (2014), phenomenological research is grounded in philosophy and psychology; it is a "qualitative strategy in which the researcher identifies the essence of human experiences about a phenomenon as described by participants in a study" (p. 245). Lived experiences can be defined as anything available to the human consciousness – this means an object can be "real or imagined, empirically measurable or subjectively felt" (van Manen, 1990, p. 9). The goal of phenomenological research is not to employ a theory that will allow us to "control" or "explain" the world; it is to provide a "return to experience," which allows for a reflective structural analysis that describes the lived experience (Moustakas, 1994, p. 13; van Manen, 1990). To accomplish this, phenomenological researchers focused on understanding everyday experiences by bringing forth descriptions about how we experience a phenomenon prior to reflecting upon it (van Manen, 1990). According to Giogri (1985) there are two descriptive levels within the phenomenological approach. In the first level, naïve descriptions are gathered through open-ended questions and semi-structured interviews (Giogri, 1985, p. 69, as

cited by Moustakas, 1994, p. 13). In the second level, "the researcher describes the structures of the experience based on reflective analysis and interpretation of the research participant's account or story" (Giogri, 1985, p. 69, as cited by Moustakas, 1994, p. 13). To understand how phenomenology provides a return to experience one must reflect on the historical underpinning of the approach.

Philosopher Edmund Husserl is the founder of phenomenological research – it is Husserl who first coined the term and concept of the *life-world* (Koch, 1995). According to Koch (1995), Husserl claimed the life-world was not something that could be easily accessed, as it consists of things that are "taken for granted" or "common sense" (p. 828). By illuminating these experiences, Husserl believed researchers could uncover the "ultimate structures of the consciousness", also referred to as *essences* (Koch, 1995, p. 828). Husserl's work is defined through three dominant concepts: *intentionality, essences, and bracketing* (Koch, 1995). Perhaps the most novel idea proposed by Hursserl was that of intentionality. "*Intentionality* refers to consciousness, to the internal experience of being conscious of something; thus the act of consciousness and the object of consciousness are intentionally related" (Husserl, 1931, p. 243-244, as cited by Moustakas, 1994, p. 28). Intentionality states that an object cannot exist without consciousness, and according to Husserl an object may be imaginary or non-existent (Moustakas, 1994). Moustakas (1994) provides the example of a landscape – a landscape exists, however one's perception of the landscape gives it meaning and allows it to appear in the consciousness. Moustakas (1994) writes, "The *objectifying quality* is the actuality of the landscape's existence, as such, while the *non-objectifying quality* is the joyful feeling evoked in me by the landscape" (p. 29).

This study was guided by a Husserlian phenomenological approach, as presented by Moustakas (1994). The researcher followed Moustakas's approach to studying lived experiences within the constructs of *Epoche, phenomenological reduction, imaginative variation, and synthesis*. Each construct is discussed in further detail in the Data Analysis section below.

Sample and Data Collection

The researcher purposefully selected participants, as it was essential that all participants had experienced the phenomenon being studied. Purposeful sampling ensures that the researcher selects "individuals who will best help them understand the research problem and the research questions" (Creswell, 2014, p. 246). To solicit participants, a personal acquaintance of the researcher forwarded the researcher's contact information to individuals who were suitable for the study. Those who wanted to participate in the study contacted the researcher to participate in the study. The sample size for this study was 10 participants. To be eligible for this study, participants had to be currently working as teleworkers or been previously employed as teleworkers, worked at least 6 months as a teleworker, and be employed or previously employed as an engineer or in a similar role.

Once the researcher had interviewed 5 participants, snowball sampling was used. Snowball sampling involves recruiting participants through referrals from people who know each other and share the same characteristic (Seale, 2012). Seale (2012) states that the main problem with snowball sampling is that the researcher may end up interviewing people within only one network, which could mean they have similar experiences. While this study required that participants had experience as teleworkers, it was important to have a comprehensive understanding of telework as it pertains to engineering, not

exclusive to one organization. Seale (2012) suggests that the researcher should find multiple starting points for snowballing to access more than one network. To avoid this problem, the researcher initially recruited participants from four different companies and then used snowball sampling.

Phenomenology is used to understand a phenomenon as experienced by the participants and should describe their experiences in an authentic manner (Descombe, 2007). The primary source of data collection was through in-depth, semi-structured face-to-face interviews. This method of data collection is ideal for this study, as it permits the participants to describe their experience, while also allowing the interviewer to direct the conversation to key issues relevant to the study.

Interviews were arranged with ten participants and took place over the course of five months. They were held at a time and place that was most convenient for the participants, which was typically in the participant's office or via Skype, due to the geographically dispersed nature of telework. The tape-recorded interviews were guided by open-ended questions and lasted between 45 and100 minutes. Once interviews were complete, the researcher filled out an observational protocol form, providing an opportunity for the researcher to jot down descriptive and reflective notes about the interview, while also creating a visual sketch of the interview setting. Afterwards, the interviews were transcribed verbatim.

Participants occupied management positions in varying sectors, including mining, technology, and forestry. All participants were Caucasian males over the age of 40. Seven participants resided in Canada, two participants resided in Australia, and one participant resided part-time in Bulgaria for work purposes.

Data Analysis

Prior to data collection the researcher identified any preconceived notions and biases about the phenomenon being studied. This process is referred to as the *Epoche*, which allows the researcher to "invalidate, inhibit, and disqualify all commitments with reference to previous knowledge and experience" (Schmitt, 1968, as cited by Moustakas, 1994, p. 84). The Epoche challenges the researcher to be transparent with themselves to see a phenomenon with "new eyes in a naïve and completely open manner" (Moustakas, 1994, p. 86). By engaging in this process, the researcher is able to see only what is truly there, as put forth by the participants (Moustakas, 1994). Moustakas (1994) also states that the Epoche is seldom completed without flaw. However, it is the intention behind the process that guards the research against pre-established assumptions (Moustakas, 1994).

Once interviews were transcribed verbatim, Moustakas's analytic steps were used to analyze the data, as this method is thought to be "systematic, easily used, and easily understood" (Phillips-Pula, Strunk&Pickler, 2011, p. 68). Prior to formal data analysis, the researcher kept a journal and completed interview observational protocol forms to record emerging insights and thoughts about the subject matter. This process works as a tool to guard against bias. Shenton (2004) and Moustakas (1994) suggest that keeping a log of reflective commentary can promote subjectivity throughout the research process.

In transcendental phenomenology, *horizonalization* is used to highlight significant statements as expressed by the participants (Moerer-Urdahl& Creswell, 2004; Moustakas, 1994; Phillips-Pula et al., 2011). The individual statements were listed in a table to allow readers to gain an in-depth understanding of the phenomenon and how the participants experienced it. Initially all statements were considered with equal value, and then

repeated or redundant statements were removed. The remaining statements were referred to as the *horizons*, which are the textural meanings and invariant constituents of the phenomenon (Moerer-Urdahl& Creswell, 2004; Moustakas, 1994). The horizons were then placed into broader themes. It is important to approach this step with an attitude of openness as, "We want not to see this event as an example of this or that theory that we have, we want to see it as a phenomenon in its own right, with its own meaning and structure" (Keen, 1975, p. 38).

Afterwards, the horizons and themes were used to provide a coherent textural description of the phenomenon and answer the research questions. "The researcher addresses the research question to the units of general meaning to determine whether what the participant has said responds to and illuminates the research question" (Hycner, 1985, p. 284). The themes that aided in answering research questions were marked as a unit of relevant meaning, and those themes that appeared to be irrelevant were not recorded (Hycner, 1985). Hycner (1985) states that if the researcher is unsure whether a theme is relevant to the research question, it is best to include it and reevaluate later on.

The next step in the research process was to identify the structural descriptions of the experience, which is referred to as *imagination variation* by Moustakas (1994). By engaging in imagination variation, the researcher was able to consider how the phenomenon was experienced in reference to "the structure of time, space, bodily concerns, materiality, causality, relation to self, or relation to others" (Moustakas, 1994, p. 99). Moustakas (1994) explains that through imagination variation "the researcher understands that there is not a single inroad to truth, but that countless possibilities emerge that are intimately connected with the essences and meanings of an experience"

(p. 99). In keeping with Moustakas's research design, the final step consisted of creating a statement of meanings and essences from the fundamental textural and structural descriptions (Moerer-Urdahl& Creswell, 2004; Moustakas, 1994). By doing so, the researcher provided a *return to experience* based on the participants' experiences as teleworkers.

Ensuring Trust

Study trustworthiness is an important part of qualitative research studies. Creswell (2014) writes, "Validity is one of the strengths of qualitative research and is based on determining whether the findings are accurate from the standpoint of the researcher, the participant, or the readers of an account" (p. 201). Creswell (2014) also recommends that researchers identify one or more strategies that will be used to check the accuracy of the findings.

To ensure the accuracy of the findings found in this study, the researcher used three validation strategies presented by Creswell (2014). The first strategy was to provide a rich, thick description of the findings, as detailed descriptions allow for multiple perspectives about a theme to be apparent to the reader (Creswell, 2014). Creswell writes, "When qualitative researchers provide detailed descriptions of the setting […] results become more realistic and richer" (p. 202). This is important for this study, as the goal was to investigate the participants' lived experience.

Secondly, the researcher clarified their bias, as "self-reflection creates an open and honest narrative that will resonate well with readers" (Creswell, 2014, p. 202). The researcher also kept a journal throughout the study, as good qualitative research attempts to understand how the researcher may interpret findings based on personal background

(Creswell, 2014). Shenton (2004) suggests that researchers participate in the recording and monitoring of emerging thoughts, as to enhance credibility and promote "progressive subjectivity" (p. 68).

The final validation strategy used by the researcher involved sending the transcribed interviews back to the participants for review. According to Kenny (2012), "Moustakas (1990) encouraged researchers to return depictions to participants to see if they are accurate reflections of what had been shared" (p. 9). This is important in ensuring that the participants' experiences are present in the findings.

Role of the Researcher

As the primary data collector for this study, it is important to highlight the researcher's personal experiences and biases associated with the subject of telework. According to Creswell (2014), reflectivity is a core component of qualitative research and allows the researcher to convey how the study's findings may have been interpreted based on personal background. In phenomenological research, this process is referred to as Epoche, which is actively acknowledging one's views associated with the phenomenon, and setting these perceptions aside as a way to ensure the researcher focuses on the experiences explained by participants (Moustakas, 1994).

As a person who resided with a relative who actively worked as a teleworker for an extended period of time, my perceptions of the subject may have been shaped by how my relative experienced the phenomenon, or how I perceived them to experience it. I have witnessed and engaged in discussions about how telework can allow for greater flexibility in work and family life. However, I have also learned how telework may blur the boundaries between work and family life, which can create conflict. Additionally, I can

acknowledge that telework may lead to communication breakdown between colleagues when the goal of a project is not articulated clearly.

Having a relative who has worked as a teleworker has provided me with a heightened insight and sensitivity to key communication issues linked to telework. It is important to acknowledge that my experience of having a relative who worked as a teleworker may have influenced the way I viewed and understood the data I collected during this study. I began this study with the perception that telework significantly affects the way that people communicate with each other in a workplace setting, and that social and organizational relationships may be compromised when individuals communicate via ICT used in telework. To guard against this bias, the researcher kept a research journal with the researcher's "reflective commentary" on the first impressions of each data collection session, the patterns that emerged in the collected data, and the theories that were being generated (Shenton, 2004, p. 68).

Chapter 4: Findings

Using the data analysis procedures described in Chapter 3, the researcher organized the clustered units of relevant meaning into six themes. The themes and subthemes are described throughout this chapter.

Theme 1 – Emotional Impact

Several participants expressed feeling anxious while working as a teleworker. While none of the participants felt this way prior to starting a position that required telework, many of them described feeling anxious once in the role. Anxiety was linked to a range of factors: technology failure, lack of human contact, and managing self-image. It was also found that participants felt isolated from both their coworkers and their organizations. This was largely due to the lack of face-to-face contact with coworkers, as well as feeling forgotten or left out from important work conversations.

Anxiety. One participant, Steve, who has been working with a global company for the past 13 years and in the last three years moved into a teleworking role, spoke about the anxiety associated with technology malfunction. Steve explained, "If I'm responsible for a meeting and it's not going well; people are waiting for you, you have to reboot your machine or find another way to connect to the Internet, that can be a moment of stress. And this can put pressure on you because you are the one organizing that meeting." Steve added that, the company he works for does not provide personal assistance in cases like these. He feels that when technology does not work properly, as in the case of a meeting, that it reflects poorly on him, as he appears unprepared. Another participant, Andrew, who also became a teleworker in recent years after being employed long-term with a global company, echoes Steve's experience. Andrew stated, "These are

high-level meetings and it's like, 'You can't even solve this technology – what are you doing?' […] We really had to prepare before these videoconferences to make sure everything was set up and that it worked."

Participants also felt that the lack of human contact, which can be a result of telework, contributed to feelings of anxiety. Angus, who is a consultant for numerous companies and often works remotely, explained that initially, telework was challenging due to the lack of face-to-face interaction. He stated:

> The amount of information you could get out of a meeting dropped to less than half in terms of what you got out of the meeting and what you could convey in a meeting by phone because the body language aspect was gone. This happened overnight. But now over the years, with practice, I've been able to get a lot better now. But the flicking of a light switch back in 2006 was a bit unusual.

Andrew shared a similar experience, however it was due to feeling disconnected from colleagues, as opposed to information. He reflected:

> Anticipated anxiety, no. I didn't really know what it was going to be like. I didn't really anticipate, well, you're going to work over here, and oh boy, you have fear for that. But after getting in the position, the reality set in and you do become more isolated. And there's a lot of effort to get yourself involved with people, which were all natural things before.

He added, "You do get cut off in the day-to-day things, so I think after the first year the anxiety increased because I realized yeah you know this is pretty isolated and you weren't attached."

Several participants described feeling worried or frustrated about how their managers or colleagues viewed them when they were not present in the office. Angus stated that his employer's "biggest fear" is that he is not doing the work because they cannot physically see him. Fabian, who works out of his home office stated, "It's a very concerning aspect for a tele-employee to make sure that people are aware when they can't

contact you, that it's for a legitimate reason rather than you're on the beach". He added that he feels the need to make sure his employer knows that he is not "taking advantage of the situation of not being present to not be present." James, who works from his home office felt that most of his anxiety surrounding telework was about how he was being perceived. He stated, "The anxiety wasn't about whether I could perform the job well. I knew I could. It was about being perceived to be doing the job well. I found myself to be very self-conscious about how I spend my time when I'm working from home."

Other participants shared similar concerns and expressed their frustration. John, who telecommutes across the province, two weeks at the office and two weeks at home, commented, "There is a perception that if I am not reachable, I must be golfing or cutting my grass, or that I am watching television on my couch in the house, which is not the case. What I find is, the exact opposite." Another participant, Fred, who travels between offices to stay close to home stated, "Depending on one's boss, even though I am 57-years-old and I have worked for a long time, it's almost like if I am not there to be seen, the work isn't being done in their mind. […] I just find that some people have a very primitive views on that." Fred also felt that because telework allows him to work flexible hours that he should be able to take time during the day to complete non-work related tasks. He added:

> Right now we are building a house, so yesterday morning I had to deal with a contractor, but I also worked through the evening yesterday on company business. I would say, that last fall, I probably did 5 all-nighters. I think if you calculated your time and work balance, it would work out in the company's favor in the long run. I think when people have the flexibility, they are willing to do more and feel more loyalty to the company if they have that kind of understanding. I don't understand why it's such a big deal, but it seems to be. It's just some people's issues, right?

In the same vein, Victor, who works out of an office that is geographically close to home, but is located a few hours away from his company's head office stated, "In a local workforce […] you could waste 30 minutes by engaging people and it's important to build up social networks and relationships with people, whereas at home, I'd get up for a couple minutes and feel guilty for not doing my work." In these cases, participants felt a sense of guilt when they took a break from work due to concern about how this behavior would reflect upon them as an employee. However, they also felt that they shouldn't see it this way, as teleworkers often work long or irregular hours.

One participant, Bill, who worked from his home office, would often reach out to employers to manage his self-image. He stated, "I was probably the only one who did this but I wrote a weekly report that was anywhere from 2-3 pages. They appreciated it. I learned that from project work because you didn't want your boss to not know something you were working on – you keep your boss protected." Angus followed a similar protocol, "When I'm given an assignment that's complex, I send out drafts to the boss to show my current level of thinking. There are two things – you want them to know you are constantly working on things, and they can see what you're working on in case it's way off base."

Isolation. When participants were asked about the challenges associated with telework, several participants mentioned feeling isolated, disconnected, or forgotten. Andrew lamented, "I felt disconnected, resentful, because why are people not calling me and engaging me in things that are going on that I should be a part of? You felt forgotten. So disconnected, resentful, and isolated. Yeah, you started to resent people. You think, why don't they come and find out how things are going?" James also referenced the lack

of social interaction that occurs when one is a teleworker. He stated, "You're not having any social interactions. Sometimes you just want to say, 'Ah, seriously?!' to another person. But when you're on your own you don't have that luxury." Victor echoed this thought as he reflected on his telework environment compared to his previous office environment, "Here, while there's an office of 40-50 people, you don't feel connected to them whatsoever. My job will ultimately affect their work but I don't need to interact with them on a daily basis or even a weekly or monthly basis. So it's very, not alienating, not lonely either, but it's just different. You come in, you do your job, and you go home."

Henry, a teleworker who worked six weeks in and six weeks out in another country, offered a unique perspective of isolation. He stated, "You get your six weeks in and then you're done. The first three aren't bad and then the last two take forever. This is my last rotation; I just resigned two weeks ago. I didn't anticipate how hard it is to be away from my family." Henry went on further:

> There's nothing to do, there's no company softball team or anything like that. The guys hang out in groups and smoke their cigarettes and they go out at night. People are in their apartments, or out in the villages with their families where they are from. Not much to do, nope. You gravitate to different people, those who speak English, or are bilingual so that's helpful. I don't sit in my apartment; I'll go out to a café. You have 2-3 contacts that come by or not and that's about it.

He added, "You lose the face-to-face and the time difference is a factor too. 8 hours is a tough time difference because people in [city] are just waking up when people here are shutting down." He also felt that the language barrier was a factor in feeling isolated. He said, "I have a buddy who is originally from Lebanon but he can speak decent English. But when he's not around, there aren't too many bilingual people here. Obviously when you're going out you don't want the other person to have to translate all conversations."

Other participants felt isolated from the "internal politics" or the "organizational savvy". Angus said:

> I would say that in my setting it would be more about the internal politics about how things are occurring and the bits of information that people have. Normally, in a work setting you'd be able to connect to a number of people. You could be talking about a person to another person or about an interaction you had with someone. You get a sense of the company politics so that you can more effectively interact. But when you telework you feel cut off and don't really have that same sense of what everyone is doing and how everything is interacting together. But because you can see it, you feel very much at a disadvantage.

Similarly, Bill stated, "The organizational savvy – you know, I didn't have that face time or you know, the work structure to become one of the "old boys". Whether that's good or bad I don't know, it just didn't happen. It's probably detrimental to a career." Bill further explained how being a teleworker made him different than his colleagues, "The 9-5ers, the guys in the department, why I was a bit of an outlier was because I had a global reach. I had a different scope and it was what it was, I didn't want to hang out with the people from the [main office] anyway."

Theme 2 – Workplace Relationships

Importance of workplace relationships. The majority of participants reported that having friends at work was important to them. Some felt that workplace relationships helped them to feel a sense of belonging to an organization. Angus said, "I think what you want is a sense of belonging; you develop it in a certain way, sometimes with a lot of friends or being connected to the corporate vision." Angus described feeling frustrated with how telework negatively impacted his sense of belonging to the companies he has worked for. He felt as though he did not have the team aspect at work, and that this contributed to feelings of isolation. He stated, "It's isolation from a general sense of being part of a team who is trying to accomplish something. They [friends] would offer

support in the sense that each person has a role to play, everyone is succeeding or not, or struggling or not. With a team you get a sense that people understand your problems, which is therapeutic." He described his work as being only focused on task output, "I don't feel a part of a team, and you just feel like you are on your own. You're doing a task and they [the boss] do whatever they want with it." Steve had similar feelings towards the idea of "belonging" to an organization and being part of a team. He said, "I think you need that physical contact to the organization and your peers. It helps. If you were always working remotely, it would be difficult to see how you are a part of this team and organization – to get a feel for what's happening." Workplace friendships were very important for Steve – he felt that being physically present in the office was essential in maintaining these relationships. He said, "I always need to be in contact with people in some physical presence. I will never stay home for the full week, I will come to my office 3-4 times a week."

Several participants mentioned that friends were important because they offer help or support. Steve said, "They [friends] are a good way to exit from job stress, or the work environment. Having friends at work is good, sometimes if you have difficulties you can chat with them, they can help you, you can help them." Henry said, "For me, it's [friends] pretty important. You have maybe, not friends, but confidants that you can go to for certain needs or situations." Fabian made a similar remark, "I think it's quite important because through those friendships, you can have a much more productive work environment. They [friends] are the most willing to help you."

According to Andrew, being able to share his work with colleagues and receive feedback is very important. He said, "You need that face-to-face interaction because

when you're doing face-to-face you can relay the work you're doing, they tell you about the work they're doing, you know, each person gets a high out of that. It's uplifting, you get something positive out of it, and with that energy the mind starts to be thinking and creating." Fred also felt that being able to share his work with others was important. He said, "When I am on the site and doing something deeply technical, it's difficult to share it anyway. I am quite comfortable to work on my own. But sometimes, you're like, 'Wow! I got it!' And you want to share it with someone."

Some participants felt that friendships were not that important, however they emphasized that good working relationships were. John said:

> I have been working here for 13 years now. We aren't that close. For the most part, the younger staff sticks together. And then, there's the older staff, like the old, white guys, and they are not that close. They do their own thing. For the most part, I would say I have a very solid relationship with them. But it's not a personal relationship. It's a working relationship. And it works.

Similarly, Victor said, "I've always found these are relationships out of convenience. It's because they are there, that's why we are friends. While there are some guys here who are nice, I generally don't engage with them on the outside. I wouldn't say they are friends, more work colleagues." Bill felt that because he often worked on projects, that he did not have the opportunity to develop friendships. He said, "You don't get a lot of friends, other than colleagues and acquaintances. I meant there's some colleagues in [city], one of them is still there, and he's a good friend of mine. I miss that, that camaraderie, but it wasn't important for the work I had to do."

Challenges of workplace relationships. When participants were asked to discuss any challenges they encountered when trying to maintain workplace relationships, most

of the challenges were associated with the amount of effort required and the anonymous nature of telework.

Angus felt that workplace relationships required a greater effort on the part of the teleworker. He said, "Workplace relationships almost go away. The nature of a relationship just goes away. Everything defaults to task rather than a relationship because there's just no time. You don't want to sit on a call for two to three hours just to maintain a relationship." James shared a similar experience, "The only phone calls I receive are 'I've got a problem, can you help me with this?' It's never a social call. That's fine, it's not like it's normal behavior to just call people from work and have a chat, at least not in my experience." Fabian described feeling that he did not have as many friendships at work as he would like. He felt a closer friendship to those he has done work related travel with due to "more social interaction, as we have breakfast and dinner together, and you talk about things that are not work." However, in his day-to-day work "there's more business talk and less understanding of what that person is really like."

Other participants drew attention to the anonymous nature of telework as a barrier to maintaining friendships. For Fabian and Bill, the anonymity hindered colleagues from understanding their roles. Fabian stated, "A challenge is self-promotion. There will be people in the office who don't know who I am or what I do because they can't physically see me. Also, I will have to try and find out who is new in the office because there is no notification system for that." Bill echoed:

> It wasn't until after when new people came in, they were kind of like, 'You did all this?' They didn't know what I did and I think that's partly because the boss I had might not have been letting people know all the stuff I did. I'm not exactly sure. […] I think if I had more time in the office that it would have been different. People would have known who was doing the grinding, the work. I would have been more evident and transparent.

James described feeling forgotten by colleagues. He said, "They kind of forget about you. It's weird to say but that's the case. One of my colleagues, I almost never speak to him because what we do almost never overlaps. His desk is right opposite my desk when I'm at the office, so the only time we talk is when I'm physically there."

For another participant, John, lack of non-verbal cues and face-to-face time can negatively influence relationships. John stated, "If you are not used to seeing slight changes in perception and body language, or you can't read body language very well, then that can become an issue." He elaborated with an example:

> One of our main partners is highly intellectual; he's a major nerd, very smart. He works out of [city], as a teleworker and he doesn't have much interaction with folks. He is not up here [in main office] much either. The reality is, the difficulty has more to do with the challenges he has around understanding how to interact with people. When he is here, he still has the same problem, but telework can compound that problem.

Other participants communicated the feeling that the lack of body language in telework negatively affected their workplace relationships. Participants made similar statements including, "the body language is lost" and "face-to-face is always better." Steve said, "It is always better to be face-to-face, you know people, their body language and attitude. The physical presence allows for much more interaction. That's the negative thing about being remote and using tools." James echoed this statement, "I don't know sometimes it's better to be physically there, people just respond better to you being there, and there are more visual cues for me to tell that this person is maybe not grasping what I'm trying to say, which I might not get if I'm watching over a camera." Another participant, Fabian described using communication tools to address the absence of social cues, "It's interesting because I do that [engage the video function] when I don't know someone as

much to begin with, so that way I can see their reactions, body language, and see how they are responding, and they can see my environment, that it's an office."

Informal communication. Engaging in informal conversation with colleagues can be a key to developing friendships. When participants were asked about the frequency and context of non-work related conversations with colleagues, it was found that these types of conversations did not happen often, and when they did they were typically in a face-to-face setting.

Angus made a comparison between informal talk in physical and virtual meetings: "When you do a meeting in person there's lots of opportunities to talk informally before and after the meeting, but meeting via Skype or phone call, once it starts it's very formal right away. There's no informal before and after to chitchat."

Steve stated that when he has an established relationship with colleagues that they often will engage in small talk. However, he does find that informal talk can sometimes be awkward in some settings: "I find it awkward sometimes in a 5-10 person conference call, they'll be talking to each other saying, 'Oh hey, what happened with your daughter?' Why are you talking about that with all these people? But sometimes yeah, we will do that." Victor also shared a similar experience, as he more often converses with colleagues he already has a personal rapport with: "For those I've met before it's the usual, right. How's it going? How was your weekend? Etc. There's that small talk." He further expressed that small talk often does not go any deeper:

> It's not often that when you broach a brand new subject. For example, a guy had a brand new baby, so it's not often that you would go past that small talk, like how are you feeling about it? Where you may in person talk on that level because it's kind of personal, but through technology is doesn't have that same personal touch where you'd ask really person questions. To an extent it's all fluff."

James also felt that because technology tends to be impersonal, it does not lend itself well to informal conversation: "There's never been any written communication about family – I don't know, that would be kind of weird, it would seem impersonal to me." He added that informal conversations occurred only a few times a week and normally through Skype or phone, as they allowed for the voice function.

Another participant, Andrew, stated that informal conversations occurred either on a weekly or monthly basis, however this only happened while the participant was face-to-face with their colleagues. Andrew said, "So by phone, I don't think you do that a lot by phone, mostly face-to-face, which would be every quarter." In another instance, John stated that while he did not engage colleagues in informal talk, his colleagues often would: "I don't, but they do. It will happen most often in person. […] If I haven't been there for two weeks, I will just call to see how things are going and which projects are on the go, and then they just start unloading. And it seems to be happening a little bit more on Skype. It seems to happen a little bit more face-to-face, which I think is normal."

Theme 3 – Information communication technology (ICT) in the workplace

Email miscommunication. When the subject of workplace conflict was brought up, multiple participants linked miscommunication to email. James remarked, "What I've found is email is particularly bad for that kind of thing. Stuff gets lost in translation all the time. So I've found that I have to be very clear in my emails. I'll actually spend more time crafting an email than most people would." Andrew shared a similar sentiment:

> What happens is, people on emails are quite happy to argue with you. They will make up these long argumentative chains of nothing because they misinterpreted. So what I found is that by not being face to face, you leave yourself open to misinterpretation, and when you get misinterpretation the whole communication thing breaks down, and you see all these emails going back and forth and you think, what are they arguing about?

Andrew added, "I think they argue with each other because they've got egos and they want to look as if they are the best debater. That's the danger of email – especially if you copy people, you do not want to be seen as weak in your emails." Another participant, Victor, also felt that email could encourage conflict. He reflected, "A couple emails came in that could be taken as rude, disrespectful, but I just constantly replied back to them as nicely, as kindly as I could. I would just respond with, 'Is there anything I can do to help?' And they would come back with a new list of problems."

The participants who experienced email miscommunication felt that a voice call via telephone or Skype was best way to resolve the situation. Andrew shared, "If you get on a phone call and face-to-face with people you can sort of defuse situations very quickly." James made a similar statement, "I've found, over time, after I've had 3 or 4 email conversations, and you are having the same issue, I call. A phone call clears it up right away." Fred also had success in resolving email miscommunication by using telephone; "I had this interaction with a consultant from another company who was a total egomaniac. We had some email exchanges that were very aggressive on his part. Eventually, we chatted on the phone and straightened everything out." Fabian felt that phone or video is the best way to resolve email conflict as the coworkers are able to see his body language and hear his tone of voice, which creates a clearer depiction of his "take on things."

Video not utilized. Several participants remarked that the video function is rarely used. Some participants felt disappointed by this, as they believed video could enhance communication, while others saw little value in using this function. For example, Steve remarked on the benefit of using video, "Very rarely people are using their camera. I

don't know why, it seems like it would be more charming or funnier to see people." Another participant, Angus, expressed surprise at how few people use this technology, however, he felt that when it is used the result is more effective communication. He went on to describe the different ways technology is used by teleworkers and non-teleworkers, "Teleworkers use them all the time because they adapt to people and their skill levels. However, non-teleworkers are extremely illiterate about these technologies. The best people to be teleworking with are other teleworkers because they understand." John shared a similar experience with coworkers who will not adopt video technology. John said, "There are some members who don't like it and we can't convert them. They are all old, white guys. I'm serious. I don't want to stereotype but they literally are, old, white guys. They don't want to use Skype and the reason why is that it's too much of a distraction. We can't convert everybody." He added, "Your problem will go away if you fire them, or if they die."

Other participants felt that video provides little benefit. For example, Victor said, "There's very little value to be added in seeing the other person. If someone were to call me, the natural is just audio, not video as well. If someone wanted to have a video conversation with me, it's not off putting but it's like, oh okay, this is not my norm." Bill commented on his experience with video conferencing, "The only time I did video conferencing at [company] was a couple times to do a project review instead of flying people there to do it, and it was just a disaster."

Other participants discussed the use of video related to the context in which it occurs rather than the perceived benefits or disadvantages. Fabian remarked, "Traditionally, there isn't very much videoconferencing in day-to-day meetings or even weekly

meetings. It's normally if the CEO is making a big announcement – he will stream the video from where he is." Andrew said, "Yeah, I did use video conferencing but it wouldn't be the number one usage. You'd probably just do a teleconference but if you have more than one person, video conferencing is very good. However, if it's one-to-one it is not needed." He added, "My preferred method of communication is video conferencing; ours was good, and it was effective." Another participant, Fred, felt that video conferencing can be limiting due to technology malfunctions, as well as having to relocate from his office to another office in order to use the company's video conferencing setup. He said, "Phone is the way to go. Video is too limiting."

Experience with conference calls. After discussing the video function with participants, a number of them went on to describe their experience with conference calls and the associated challenges. Angus said that it has been very difficult, "almost impossible" to follow the conversation. He felt his coworkers did not understand the difficulties. He remarked, "There's no appreciation for how difficult it is for the individual. I think these things have evolved out of convenience instead of effectiveness. There's very little thought put into it for us [teleworkers]. The technology is more advanced but people are not using it in a more advanced way." Bill expressed his frustration; "It's exasperating because people don't identify themselves on the phone." Andrew also felt that it was challenging to be a part of the conversation during a conference call. He said, "When I'm sharing something, I would say the feedback is not great because you're not in the room. They tend to discuss amongst themselves and you're sort of listening. It's very hard to have an ongoing conversation with people who are in a meeting and you are remote." Fabian echoed this experience:

> It's challenging because first you need to check that they can still hear you because you might be the first person to talk, and second you usually have no visual cues so you don't know how receptive the audience is to what you are saying. A lot of the time the group or entire room will mute the phone so you can't hear the sideline conversation, so you won't know if you've offended someone or said something that resonated with someone. You don't know how on target you are with what you are presenting. You miss a lot of feedback from the group you are speaking to.

Feedback may also be hindered by the inability to find an appropriate time to cut into the conversation, as Steve mentioned. He said, "If you aren't clear on something, you can ask for more context but you would then hold up the meeting with the other people there. It's not the same as being in a room with a group where if there's a break you can stop and chat. You have to be very prepared." In another case, feedback may be difficult if one participant of a conference call dominates the conversation. Fred described his experience with this: "It has happened where I have been on one of these calls and someone in the room bullies everybody into submission. The person, who might want speak up and say no, doesn't."

Preferred technologies. When participants were asked about their preferred method to communicate, many immediately said that face-to-face was best. For example, Angus felt strongly that telework did not produce enough face-to-face time, "Everyone has a preferred amount of face-to-face contact, and telework for everyone doesn't produce enough." After prompting participants to describe specific technologies many mentioned technologies that provided instant visual or audio feedback. Angus stated, "I think the thing I saw that was the best was with [company], it was called the 'Halo' system. It was a sophisticated Skype […] the clarity was amazing […] extremely effective."

Participants also made a point to connect the type of technology with the context of the task. Steve said, "Preferred is voice or over the phone." He added, "But sometimes the time zone is different, or the topic is too big, or I need to provide some kind of documentation so I use email." Victor felt that an audio call would be appropriate if an instant message or Skype text chat went beyond 10 messages back and forth. Victor said, "I get annoyed when I send an email and I get a one-line response back, when you could have just asked me in a Skype text chat." He added, "You switch communication mediums depending, and you have to gauge that." Fabian made a similar statement, "It all depends on the criticality of the item I'm working on from a time sensitive nature." Fabian felt that if a question or task were time sensitive, he would use IM via Skype to see if they were available to answer a question. However if a task required an in-depth conversation, Fabian preferred to set up a teleconference meeting using Skype or WebEx, which allowed him to share a PowerPoint presentation.

A number of others referenced Skype or WebEx as their preferred technology. Andrew said, "When [video conferencing] works and works well, then it is excellent. Things like WebEx, with the video are very useful as well. My preferred method is the video conferencing system." John stated that Skype, teleconferencing and phone were all preferable. John also found Skype to be beneficial, "I like Skype because it's a combination of both [phone and email] and I get instant responses and then if I have to call I can get them right off the bat."

Participants stated email as being less preferred, even though it was used often. Email was frequently referred to as being more "formal". James said, "Email because it allows me to formulate a response and elaborate, and have something in writing so I have

something to refer to." Fabian also felt this way, "Email to me is more formal; it feels more like a trail or log of the information." Only two participants mentioned email as their most preferred medium.

Theme 4 – The Nature of Telework

Type of Work. For many participants it seemed that telework had transformed the way they worked. This transformation was often spoken about in contrast to work previously done in a traditional workplace setting. The main point that was reiterated by participants was that the work went from a management role to a knowledge worker role. This meant that participants went from being responsible for the management of their employees, which included being available to them throughout the workday, to becoming responsible for the output of ideas and knowledge, which required very little interaction with coworkers. Angus described this shift:

> The work was very new work; in the traditional office I was managing people, whereas in telework I have no one reporting to me. I'm doing the reporting. In the traditional office I had no personal thinking time to get tasks done. When you're a manager you tend to not spend any time thinking and all your thinking time gets delegated. In telework you have more thinking time, but you have to apply it. If you do, you will notice that you do higher level work. People employ you to think, as opposed to manage people. In hindsight, the traditional office was taking away my thinking power; they were dumbing me down and making me handle a bigger span. In this role I have no span, I just concentrate and think at the highest level I can. The work is more satisfying in that way. In the past how many people reported to you was a sense of your worth, so how you evaluate your worth changes.

Fred shared a similar perception of being a knowledge worker, "They talk about knowledge workers, but it's more than that. I am a thought worker. So I am always thinking to provide solutions to problems. You have this specific knowledge, but you have to integrate it to find a solution to a new problem."

Other participants acknowledged that their work had changed once they became a teleworker, however the link to being a "knowledge worker" was not made. Steve said, "Before we used to have direct reports, people worked for me and the team I worked with was very close to me. Today it is totally different; I do not have direct reports anymore, as I'm more of a liaison person." Fabian shared, "I would say it is a middle management position, with the title of product manager, which means I'm responsible for software products these days and not necessarily the management of people." Andrew also spoke about how he no longer managed people and attributed this change to his company being globalized. He explained:

> Yes there was a shift, so very much. My job and the style of jobs we've had over the years were very traditional, where you have the face-to-face all the time, the guy next door you talk to and you manage him. That's changed because the companies have become global, and when you become globalized it's a different structure you have to work under because now you're not just operating in your local company, you are responsible for people outside of that, so it's definitely shifted.

Productivity and flexibility. For most participants productivity and flexibility were paired together. Telework was frequently associated with being a more flexible workplace than a traditional office setting, and flexibility was directly tied to being more productive.

Interruptions from people or day-to-day activities were thought to lower productivity at work. For example, Steve was able to avoid time wasters, such as traffic during the commute to the office. Steve explained, "I don't have to fight traffic or commute. […] I would sometimes work from my home for different reasons […] I can do things much faster. I can get to the people I want to in a matter of minutes. It's very positive and productive." Fabian also mentioned that telework solves issues with the

office commute, "It allows me to have a better personal life because I don't have to commute and I have better flexibility in my working hours, as well as more opportunity to spend time with my family members. It gives me greater flexibility in my working hours, unless I'm traveling for work. Before I would lose 2 hours per day while commuting." He added that it is also important that he is able to go into the office when needed, "to have face-to-face meetings with people I haven't dealt with before but need to on projects."

In another case, Fred, who was in the midst of building a new house, felt that the flexibility associated with telework allowed him to manage the daily tasks associated with that project while continuing to work. He said, "I had to deal with a contractor. But I also worked through the evening yesterday on company business." He added, "I have had some bosses who valued face time more than others. To be honest, those who are more flexible that way got better work out if me."

Other participants felt that less interruption from coworkers and employees was the reason for higher productivity levels. Andrew said:

> It's interesting because productivity does go up, as opposed to previous jobs where you are managing people and everyone is coming in because you have an open door policy. You have to give your attention, drop what you are doing and deal with that person, and then when that person is done another person will come in and knock on the door. So the interruptions you have over the course of the day are quite large, to the point where you do lose focus of what you were doing. When you are not disrupted and it's left up to you, you can be highly productive at getting a task done.

James expressed a similar experience, "There's no interruptions [in telework]. If I get interrupted it can take a long time to get back to what I was doing." Angus also felt this way; "You can concentrate and shut yourself off from everything. I was able to personally do work at a much higher level because I was able to concentrate." A

comment from another participant elaborated on why fewer interruptions lead to greater productivity. John said, "I am certainly more productive now that I do teleworking, generally speaking, because I block time for meetings, and for doing stuff, as opposed to people just rolling in and interrupting me constantly. " He added, "I love the change in environment for keeping the flow of the work going, and keeping yourself motivated. […] Always working from home – that can be a drag after a while. But the back and forth, working in both environments, really pushes you to get more done."

Collaboration and creativity. The challenge of fostering creativity through collaboration with coworkers was referenced by some participants. Fabian described how difficult it was to influence employees to assist him. He said:

> I find people are less responsive and receptive to work with you and help you. Because my role is very much an influence, I need to ask for help, I can't direct people to assist me. I need to influence them that it's a good thing for them to help me achieve what my job is because then it will work for the company and then eventually come around and help them. So if I haven't had that first personal connection with them it's very hard to get the buy in from them to do work for me, to assist, or answer questions, or spend some time on something I've asked them to look into.

Bill stated, "What you're missing is the social interaction and the stimulation of engaging with people. You have to get the creative juices going independently as opposed to natural interaction with people." Andrew also felt that collaboration was important for his work, "For me if I don't have that face-to-face where I can look at all the ideas and get the body language and brainstorming that would affect the long term quality [of my work]."

Theme 5 – Telework and Connectivity

Accessibility expectations. Most participants believed that they were expected to be available to take a call or answer an email at any time. This was the case for James

who felt he was expected to be accessible twenty-four hours a day, seven days a week. He said, "It's not in my contract for it to be that way but that's what it ends up being." Another participant felt that being available was important, even when off duty, to prevent anything from suffering at work. Henry explained, "You don't want anything to suffer back at the mine. Like, if you left loose ends before you left, then yeah, the expectation is that you would get back to them." He added, "The way I'm wired, I'm always connected to my work."

A number of participants acknowledged that being constantly connected was a result of personal choice, as opposed to a condition of their jobs. Fabian explained, "Like most people, I have a little bit of an addiction to checking my email that comes in at 10 pm or when I wake up in the morning. So I am still connected to work much more because of the mobile phone access." He attributed this to his concern over accessibility as a teleworker. He wants to ensure that when he is unreachable, that people understand that it is for a legitimate reason. In another case, Angus explained that because he has always been constantly connected to work in the past, that it is now expected of him. He described a recent scenario; "I have a pretty good response time, and in [coworker's] world I respond right way, at any waking hour. But one time I was out of the country and I wasn't getting their emails and he commented, "Wow, Angus didn't respond right away." Angus felt that being constantly available was important due to the limited personal contact of "just popping your head into someone's office." He added, "In a traditional office you would feel more justified going a whole day or weekend without communicating because they've seen you working all week." Similarly, Steve felt that he put pressure on himself to be available at all times, however he did not believe that

people expected this from him. He said, "That's just my personality. I would feel that if I can't [respond] I would need to have a really good reason." He also believed that colleagues should have a similar level of accessibility, and when they don't he has felt frustrated, "Sometimes I will hear some colleagues say they can't be reached while in Paris. I've been there so many times before - why are you not reachable? You can be in meetings and I understand that but you can't be in meetings all day long, five days a week."

Time zones. Geographical time zones were referenced, as a contributing factor to justify why being accessible was important. Participants also felt that when they answered calls or emails while off duty, that it was due to the global nature of their companies. Steve, who often had to travel abroad for work said, "People call from Canada in the middle of the night 'cause they don't know where you are." Other participants expressed irritation at this aspect of telework. For example, Victor often had to take calls on Saturday and Friday afternoons. He felt that Friday night was particularly inconvenient, "People in Europe just think it's Friday morning, but you might actually want go and do something." Andrew also expressed the frustration with being too connected, "If you looked at your email when you were leaving work, you could be seeing responses from people across work […] if you've got your Blackberry or whatever, you're looking at it and now you're engaging."

Boundaries. Although most of the participants felt that they were constantly connected to their work, a number of them also felt that they made a conscious choice to set boundaries. For example, Steve said, "I try to get my personal moment where I'm totally not connected." During these moments he would turn off his phone, "I jog a lot in

the morning and they cannot call me. My phone is closed from seven to ten in the morning." He added, "I've learned it's up to me to manage my accessibility. I think I manage it very well. I have boundaries." Similarly, Andrew felt strongly about the importance of "switching off", especially in the evenings. He said, "You've got to detach yourself from work and you have to do that with whatever hobbies you've got. So for me it was sports, so active sports, squash, I run." In another example, John explained that he set strict boundaries for family time. He said, "Your Skype starts going off at 6:30 pm when you are sitting down with family and having dinner. We try to keep family time pretty tight. We have identified family time as 5:30 to 8:00 pm."

Theme 6 – Organizational Role in Telework

All participants communicated that they had not received company training before they began to work remotely and this included outlining the rules and expectations for their roles. For some, they had been the first and only person within their company to be classified as a teleworker. Participants felt that the company often allowed them to do telework out of convenience or that they took it for granted. Andrew described his experience:

> I think the company realized, they probably thought it was different; they probably didn't understand the challenges, and as for mentoring, nothing, no. I would say it was very much void of any training or preparing yourself for this. Like say look, you're going for training for this position, it's going to be extremely challenging, here are the things you are going to experience, no. I think this was new to us, and globalization and working remotely was really left up to the individual to make it work.

For Angus, he felt that his position as a teleworker in the company had slowly deteriorated. He explained, "There was less and less contact maintained unless I reached out. The time zones were crazy and meetings become too difficult to set up so people just

gave up." Participants often referenced being forgotten as a risk of being a teleworker. Andrew felt that companies needed to educate themselves in order to educate their employees. He said, "You can forget about people, generally the employee that's not going to tolerate it will put up their hand and say listen, this is not right." However, as Andrew pointed out, employees often do not want to say anything.

Steve felt that, because he worked for a global company, they made an effort to bring people together on a regular basis. He said, "Here in our company they are pretty good also, they know people are traveling a lot so they will try to do some kind of a group event, either a Halloween, Valentine's Day event or contest or something. They make sure people have some kind of a thing to make sure we see each other." In contrast, the company Fred worked for had decided to forgo all company activities, including the Christmas party and golf tournament, which had always been a staple in past years. He said, "They used to have a big Christmas bash with wine and everything, but no more. It's just stupid." Fred added, "It just makes them seem petty."

Chapter 5: Discussion

The purpose of this study was to explore how engineering professionals experience telework. Specifically, the researcher examined connections between the technologies used in telework, the effect these technologies have on workplace relationships, and the role of workplace relationships for engineering professionals. Two theoretical perspectives were considered to frame this study. These were uses and gratification theory and media richness theory. To gather data, the researcher interviewed experienced teleworkers, who were employed or previously employed as an engineer or similar role. In discussing the participants' lived experience as teleworkers, this study aimed to answer the following research questions:

3. How does the use of ICTs in telework affect interpersonal communication between private sector engineering professionals?
4. How does computer-mediated communication in the workplace affect an employee's perception of being isolated in social (informal) and organizational (formal) contexts?

In this chapter, the researcher will discuss insights into these questions based on the themes and sub-themes identified in the findings chapter. To make connections between the data found in this study and the scholarly research about telework, the researcher will draw on relevant literature as well as the theoretical perspectives used to frame the study.

Research Question 1: How does the use of ICTs in telework affect communication between private sector engineering professionals?

The telework arrangement hinges on support from various information communication technologies. In asking the participants about their experience using

technologies, including email and video conferencing, insights about interpersonal communication in virtual work were uncovered.

Nature of telework. The majority of participants felt that virtual work transformed the way they worked. Participants reported a shift in the type of work they did as a teleworker compared to a traditional office worker. Participants best described this shift as going from a management role to a *knowledge worker* role, which means being responsible for the output of ideas and knowledge, as opposed to the management of employees. Davenport, Jarvenpaa, and Beers (1996) define knowledge work as, "the acquisition, creation, packaging, or application of knowledge. Characterized by variety and exception rather than routine, it is performed by professional or technical workers with a high level of skill and expertise" (p. 2). This definition gives further meaning to the term, "knowledge worker". Hill et al. (2001) found that telework was less beneficial to managers due to the type of work and responsibilities associated with management positions, which may explain why these teleworkers experienced a shift in type of work upon the adoption of telework. In addition, quantifiable work is ideal for telecommuters because it "provides concrete information on telecommuter performance, which can offset managerial concerns with regard to lack of observation" (Turetken, Jain, Quesenberry, & Ngwenyama, 2011, as cited in Allen, Golden, & Shockley, 2015, p. 50). As discussed in the literature review, Lappalainen's (2009) study on communication as a key skill for engineers writes, "Engineers no longer manage their daily tasks with plain substance expertise; instead they must be adept at communication, collaboration, networking, feedback provision and reception, teamwork, lifelong learning, and cultural understanding" (p. 123). Williams, Muller, and Kilanski (2012) support this claim; as

they explain that the new economy is defined by job insecurity, work teams, career maps, and networking. This is significant because participants felt that the shift in type of work due to the adoption of telework resulted in less interaction with coworkers. Information about the characteristics of the new economy, including the importance of work teams and networking from Lappalainen (2009) and Williams et al. (2012), may suggest that the issue of less contact poses a greater challenge than ever before. This finding may be less telling about the work of engineers than it is about the current work economy in general.

While knowledge work meant less contact with colleagues, it also meant more productivity and flexibility. For most participants, productivity and flexibility were bundled together. Participants felt that telework allowed them more flexibility surrounding work-life balance in terms of how their time was spent. The two main points discussed were avoiding a long commute to work, which can take away from personal time, and the ability to rearrange work hours to accommodate life events (i.e., building a new home). Hill et al. (2001) acknowledge that increased flexibility at work can reduce stress associated with the daily commute as well as aid in maintaining work-life balance. In addition, three participants noted that the flexibility associated with work location allowed them to avoid interruptions at work. Interruptions were believed to diminish productivity in terms of task. Illegems and Verbeke (2003) confirm that fewer interruptions can account for higher productivity. However this finding is anecdotal; as Bailey and Kurland (2002) and Westfall (2004) point out, concrete evidence of telework promoting higher productivity is often missing from existing research studies. It was also mentioned by participants that because they were able to work from multiple locations, a change in environment helped to keep them motivated at work.

One challenge associated with the nature of telework, as expressed by three participants, was the lack of creativity through collaboration with coworkers. The lack of social interaction was thought to be detrimental to fostering new ideas. For example, it could be challenging to convince others to provide help when it was needed. One participant stated that without having established a personal connection, it could be difficult to get the individual to "buy into" the request. This finding could be linked to less social interaction with coworkers. As stated in the literature review, Picherit-Duthler et al. (2004) found that when there is little knowledge about team members' abilities, limited mutual workplace identity, and lack of commitment to maintaining a future relationship, team trust and communication is negatively impacted. Picherit-Duthler et al. (2004) write, "One implication may be that team members are less willing to initiate conversations and volunteer information" (p. 123).

Telework and connectivity. Before moving into a discussion about specific technologies and the participants' experience with them as teleworkers, the researcher will delve into connectivity, specifically expectations surrounding accessibility.

As telework requires being geographically separated from the workplace, technology is required to maintain contact with managers, colleagues, and clients. Most participants in this study believed that they were expected to be available through communication technology at all times. A number of these participants acknowledged that being constantly connected to work through technology was a result of personal choice, as opposed to being a condition of their employment. Participants described being self-conscious about how they spent their time. For example, if they did not respond to a call or email within a reasonable amount of time, the participants wanted to ensure that

their colleagues knew it was for a legitimate reason. Another justification for being constantly connected was that many participants worked for global companies, operating in multiple countries with varying time zones. This study shows that being connected and accessible is an important factor in bridging the geographical distance between colleagues.

Leonardi, Treem, and Jackson (2010) found that teleworkers who perceived they were highly connected to work felt that the time and effort required to meet communication demands outweighed the potential benefits of the work arrangement. In this study, the benefits of telework included the flexibility of work-life balance and the freedom from distraction. However, some participants expressed feeling frustrated by being constantly connected to work, as it intruded on personal time. A number of participants explained that disconnecting from work is a behavior they learned with gained experience. Boundaries included "switch off" periods, which were essential to maintaining work-life balance. Although boundaries were implemented, participants reported falling victim to checking emails during "switch off" periods. It was also important that participants inform coworkers of "switch off" periods to ensure they knew it was for a legitimate reason.

Email miscommunication. As the findings demonstrated, participants often linked miscommunication at work to the use of email. A number of participants felt that email clarity was important, which often meant spending extra time to craft email content. Brewer's (2010) multicase study found that email miscommunication was linked to information sharing, specifically "lack of clear detail, incorrect assumptions about receiver knowledge, disparity of information, unnecessary information, volume of

correspondence, and missing information" (p. 337). Participants of this study experienced arguments with their colleagues as a result of email miscommunication. These arguments were described as, "rude", "disrespectful", and "aggressive". According to Brewer (2010), tone refers to "accent or inflection expressive of a mood or emotion" (p. 340). Issues of tone in virtual communication can be translated as "politeness, harshness, level of formality, humor, and lack of tone" (Brewer, 2010, p. 340). For example, politeness may cause a message to be unclear and therefore cause confusion (Brewer, 2010). In addition, computer mediated communication has been reported to lower social inhibitions, which may result in increasing instances of "voicing more radical opinions" (Dubrovsky, Kiesler & McGuire, 1986, as cited in Potter & Balthazard, 2002, p. 438).

To remedy situations of miscommunication using email, participants used an audio call using the telephone or Skype. Hinds and Bailey (2003) state that the most immediate way to resolve conflict resulting from mediating technologies is to remove the distance for a period of time. This can be done by "increasing the frequency and length of face-to-face meetings […] Because face-to-face interaction facilitates interpersonal relationships, more face-to-face meetings should promote more familiarity and friendship" (Hinds & Bailey, 2003, p. 625).

Video not utilized. According to Lurey and Raisinghani (2001), virtual workers often feel that the lack of face-to-face communication in telework makes the work more difficult. Despite this finding, individual communication tools such as e-mail, telephone, and voicemail, were preferred as opposed to team-based communication tools such as telephone conferences, face-to-face interaction, video conferences, and

groupware applications (Lurey & Raisinghani, 2001). Lurey and Raisinghani (2001) found that video conferencing was not utilized by or even available to 86 percent of the participants in their study. This study presents a similar finding, as several participants reported that video conferencing was rarely used, while at the same time acknowledging the challenges associated with individual communication tools like email. Participants shared varying views on whether video conferencing enhanced communication - the majority felt that it could be beneficial, while others felt that it added no value. Lurey and Raisinghani (2001) write, "Participants of this study revealed that video conferencing technologies were not made available because they failed to bring about the same impact as face-to-face interaction" (p. 531). Two participants in this study attributed the absence of video conferencing to a gap in technological literacy between virtual workers and traditional workers. Age was also believed to be a factor in whether or not an individual would utilize team- based communication tools. These findings indicate a need for engineering companies to understand how communication tools such as video conferencing may affect day-to-day communication between employees.

Experience with conference calls. Conference calling was also explored in connection with communication effectiveness. Problems with conference calling, as discussed by the participants in this study, included difficulty following the conversation and lack of feedback. Mutual knowledge is the shared information between two or more parties (Cramton, 2001). One problem of mutual knowledge noted by Cramton (2001) was that of *unevenly distributed information*. In Cramton's (2001) study, participants of a virtual work group would unknowingly and knowingly share information with only part of the group, and "failed to understand how this affected the perspectives of team

members who did not receive the mail, or how it affected the dynamics of the team as a whole" (p. 357). In this current study, a number of participants noted that information was held back during conference calls. This occurred when speakers failed to identify themselves on the conference call and when members had sideline conversations that could not be heard by the participant calling in. One participant said, "When I'm sharing something, I would say the feedback is not great because you're not in the room. They tend to discuss amongst themselves and you're sort of listening." This participant felt that feedback was not being directly communicated because he was not physically present. Another problem with mutual knowledge is *interpreting the meaning of silence.* Participants noted feeling as though they were unable to contribute during conferences calls. This was due to not wanting to "hold up the meeting", lack of opportunity to speak, or the conversation being dominated by one individual. According to Cramton (2001), silence is often misinterpreted as consent when perhaps it means the opposite (i.e., disagreement). In addition, "There may be a tendency to fall silent rather than address sensitive issues because of the difficulty of communicating nuances when using less rich communications media" (Cramton, 2001, p. 359). In this study, one participant explained that it could be challenging to speak up, as "you usually have no visual cues so you don't know how receptive the audience is to what you are saying". Richer technologies like video have been found to heighten social presence "due to its ability to convey more social cues" (Walter et al., 2015, p. 9).

Preferred technologies. All participants discerned that telework presents challenges for communicating with their professional counterparts. The participants' preferred technologies for telework were those that provided visual or audio feedback.

This finding is interesting as many participants reported rarely using video conferencing throughout their workday. According to Lurey and Raisinghani (2001), virtual teams prefer to use e-mail, telephone, and voicemail more frequently than ICT specifically designed for group interactions like conference calls, face-to-face meetings, groupware, and videoconferences. This study found that participants do indeed use e-mail, telephone, and voicemail as the primary mode of communication, however participants did not claim to prefer these technologies.

Appropriateness of technologies within different contexts was also noted while discussing preferred technologies. For example, telephone and instant messaging were used to obtain quick responses that did not require much detail. If the conversation subject matter became too dense, audio or visual technologies in combination with email or file sharing technologies (Skype or WebEx) were used. Email was seen as being "formal", used to "trail or log" information. Leonardi et al. (2010) support this finding, stating that instant message services are often used to communicate informally and synchronously, and as "a back-channel for conversation during conference calls, or for a simple questions that benefit from an immediate response" (p. 92).

Research Question 2: How does computer-mediated communication in the workplace affect an employee's perception of being isolated in social (informal) and organizational (formal) contexts?

As discussed in the first research question, the participants of this study conveyed how technologies used in telework affect communication with their colleagues. This was demonstrated by identifying the communication challenges in connection with types of technology. In addressing the second research question, the researcher explored how

computer-mediated communication is experienced by teleworkers in connection with a perceived sense of isolation in social and organizational contexts.

Workplace relationships. Most of the participants in this study felt that workplace relationships were important to them. For a few participants, this was attributed to a sense of belonging to a team or organization. For example, a participant remarked, "They [friends] would offer support in the sense that each person has a role to play, everyone is succeeding or not, or struggling or not. With a team you get a sense that people understand your problems, which is therapeutic." According to Belle et al. (2015), "Knowing how to be, knowing how the organization works, and understanding others" is linked to a level of belongingness in terms of professional success and personal fulfillment (p. 90). Other participants felt that workplace relationships offered them help or support. Participants understood help or support as having a confidant to go to for work needs or situations. Ducharme and Martin (2000) and Major et al. (1995) found workplace relationships, whether they were affective or instrumental, to be essential to job satisfaction, however the opposite was found by Fay and Kline (2011). Workplace relationships were also believed to promote collaboration in the workplace. According to Picherit-Duthler et al. (2004), a consequence to absent workplace relationships is a lack of willingness to socialize and exchange, or offer up information.

While most participants agreed that workplace relationships are important to them, they felt that telework created challenges in maintaining these relationships. The findings revealed the greatest challenges were associated with the amount of effort required and the anonymous nature of telework. Due to the nature of telework, being that it often requires less social interaction with colleagues, participants felt that workplace

conversations simply default to being task related. One participant remarked, "The only phone calls I receive are, 'I've got a problem, can you help me with this?' It's never a social call". Another participant referenced the amount of time and effort it takes to maintain workplace relationships, "Everything defaults to task rather than relationship because there's just no time. You don't want to sit on a call for two to three hours just to maintain a relationship". According to Fay and Kline (2011), informal communication is essential for teleworkers to develop feelings of attachment for each other and their organization. Participants of this study revealed that informal communication with coworkers does not occur while using information communication technologies. For others, feeling anonymous caused workplace relationships to suffer. For two participants, this meant that colleagues did not understand their roles within the organization, which made self-promotion difficult.

Isolation. Several participants reported feeling isolated, disconnected or forgotten by their peers due to working remotely. One participant recalled wondering why coworkers weren't reaching out to talk, which caused him to feel as though he was missing out on important interactions happening within the office. By being physically absent from the office, participants felt "cut off" from organizational politics, which was viewed as a disadvantage or even detrimental to a career. While participants did not specify how being cut off from organizational politics was a disadvantage, Champione (2008) found telework to be positively related to less career development opportunities and less organizational commitment compared to traditional office workers. In addition, Golden et al. (2008) state that professional isolation in telework can negatively impact job performance.

For others, isolation was experienced in a social sense. One participant remarked, "It's [telework] very, not alienating, not lonely either, but it's just different. You come in, you do your job, and you go home". Another participant reported missing being able to commiserate with colleagues, "Sometimes you just want to say, 'Ah, seriously?!' to another person. But when you're on your own you don't have that luxury." Ducharme and Martin (2000) found that social support from colleagues was important for job satisfaction, as it offers an exit from job demands and pressures.

Organizational Role in Telework. An important insight into why participants felt isolated in social and organizational contexts was the role their organizations took in preparing them for the transition from traditional office to virtual office. All participants reported that they did not receive company training before they began to work remotely, and this included outlining the rules and expectations for their roles. A number of participants felt that the company allowed them to telework out of convenience and that many of the challenges associated with telework were not understood. The majority of participants did not anticipate the challenges they experienced before starting to telework. The main anxieties that arose were; lack of technical support, lack of human contact, and challenges of self-image management.

When participants experienced a technology malfunction, they believed it reflected poorly on them. According to Mann et al. (2000) a lack of technical support for computers or work assignments can leave workers feeling "worried, panicky, frustrated or even fearful" (Disadvantages of teleworking, par. 7). The deterioration of workplace relationships and general lack of human contact was also concerning for participants. Ducharme and Martin (2000) found that employees tend to be highly satisfied with their

jobs when the organization promotes and encourages the importance of workplace friendships. Only one participant felt that his company made an effort to bring people together through events as they understood that being a global company meant people were often separated due to frequent travel or work arrangements. In managing self-image, due to the lack of human contact, participants described feeling anxious over how they were being perceived by managers and coworkers. Participants often felt that because managers and coworkers could not physically see them, they would assume they were not working. This finding may suggest that the participants' companies do not have functional reporting and feedback methods for teleworkers.

Uses and Gratifications Theory

Uses and gratifications theory (U&G) is used to explain why users choose a particular communication channel and message, and examines the interpretation, response and impact of this selection (Rubin, 2009). U&G states that users actively engage with media and that they make rational decisions to determine which type of media will fulfill their personal needs and values (Dainton & Zelley, 2011). McQuail et al. (1972) developed a typology of media-person interaction. The typology included, diversion (escape from routine or problems, emotional distraction), personal relationships (companionship, social interactions), personal identity (self-reference, reality exploration), and surveillance (information seeking) (as cited in McQuail, 2010). In examining gratifications from an organizational perspective, Danowski (1980) found that professionals base communication on three main content categories: production, innovation, and maintenance.

In this study, participants chose to communicate with colleagues using different communication technologies for specific contexts. One participant said, "You switch communication mediums depending, and you have to gauge that." Specific examples noted by participants included; instant message or Skype text chat for quick time sensitive answers, Skype or WebEx for in-depth conversations that needed to be supported with additional documents like a PowerPoint Presentation, and email for formal and information dense tasks in which logging the information was important. These instances depict person-media interaction for information seeking.

Uses and gratifications theory may offer insight into how situations of email miscommunication are addressed. Email miscommunication was often a result of the receiver misinterpreting the content of the message. One participant described his experience: "They will make up these long argumentative chains of nothing because they misinterpreted. So what I found is that by not being face to face, you leave yourself open to misinterpretation, and when you get misinterpretation the whole communication thing breaks down." The participants who experienced similar situations strategically used a voice call via telephone or Skype to remedy the situation, as it allowed increased cues (tone of voice) to be present within the conversation. In this instance, person-media interaction was used to gratify the need for information seeking and arguably personal relationships. However, U&G does not explain why the email miscommunication occurred in the first place.

The findings demonstrate that video conferencing was rarely used in day-to-day work. A number of participants felt disappointed by this, as they believed video could enhance communication. The main reasons to explain this were a disconnect in

technology use between teleworkers and non-teleworkers, and the lack of technology integration on the part of the organization, perhaps only using video conferencing for large group meetings or announcements from CEOs. U&G does not account for why participants in this study would forgo video conferencing if they believed it enhanced communication and if effective communication between colleagues was important to them, which it was. Dobos (1992) states that while media is chosen based on how it is believed to perform; it may also be influenced by "organization wide perceptions of the communication functions served by various channels" (p. 45). Further, workers may choose a media that they have experience with to avoid the risk involved in selecting another media they are less familiar with (Dobos, 1992). Dobos (1992) writes, "Such choices are not always optimal or efficient. Although face-to-face communication is less efficient (e.g., prone to digressions and interruptions), it may be preferred to the extent that it provides more gratifications than other channels do" (p. 45). Since video conferencing is not typically used in the organizations of the participants, they may choose to forgo using this technology as a way to "minimize the risk of social disapproval for 'inappropriate' choices", therefore showing colleagues that they are socially competent (Dobos, 1992, p. 45).

Media Richness Theory

Media richness theory states that media use affects how users communicate. Media richness is determined by evaluating four characteristics: speed of feedback, ability to personalize the message, availability of multiple cues, and language variety (Dainton & Zelley, 2011). Based on these factors, a medium can be labeled as rich or lean. According to Daft and Lengel (1983), face-to-face communication is the richest

form of information processing because it allows for multiple cues (body language, facial expression and tone of voice), and immediate feedback.

Media richness theory can be used to understand why the participants of this study experienced feelings of isolation in both social and organizational contexts. In a social context, this study found that participants did not engage in informal, non-work related conversations with colleagues when using information communication technology. This only occurred when colleagues were face-to-face: "When you do a meeting in-person there's lots of opportunities to talk informally before and after the meeting, but meeting via Skype or phone call, once it starts it's very formal right away." In another instance, workplace relationships were deemed difficult to maintain due to the amount of time it would take: "You don't want to sit on a call for two to three hours just to maintain a relationship". The lack of body language in telework negatively affected how teleworkers communicated in informal contexts: "It is always better to be face-to-face, you know people, their body language and attitude. The physical presence allows for much more interaction." Another participant felt that ICT was too impersonal for these types of conversations. These remarks are in line with the idea that ICT are less rich than face-to-face communication, and that they "may impede employees' abilities to learn more about each other's background and personality" (Sias et al., 2012, p. 257).

Information richness is key in explaining how organizations reduce equivocality (Daft & Lengel, 1983). "Rich media enable people to interpret and reach agreement about difficult, unanalyzable, emotional, and conflict-laden issues" (Daft & Lengel, 1983, p. 49). Participants' experiences using email and telephone conferencing aided in understanding how teleworkers might feel isolated in organizational contexts. A number

of participants described email miscommunication due to receiver misinterpretation or the misinterpretation of the sender's message. In this case, an audio call, a richer media type, was used to remedy the situation. Telephone conferences also presented barriers in terms of richness. Due to the absence of physical presence, participants found themselves experiencing difficulty following the conversation (i.e., who was speaking and what was being said) and lack of feedback (i.e., could not gauge how coworkers reacted to contributions made by the participant). In addition, the lack of face-to-face interaction with colleagues made them feel as though they were missing out on opportunities to understand internal politics, as well as manage their image, which was expressed as ensuring professional counterparts knew they were working as opposed to spending the day at the beach or watching television.

Chapter 6: Conclusion

The purpose of this study was to understand the ways in which information communication technology affects interpersonal communication and perceptions of isolation of teleworking engineers in the workplace. In using a phenomenological research approach, the goal of this study was not to explain the lived experiences of the participants, but to understand them by providing a return to experience.

The experiences of the participants demonstrated that information communication technology did affect interpersonal communication in the workplace. The participants in this study felt that, because telework required them to be geographically remote from the office, accessibility through the use of information communication technology was an important factor in bridging the distance with colleagues. As virtual workers, the participants commonly used email and conference calls to communicate with their colleagues, and these were often considered as being unsatisfactory modes of communication. Participants experienced conflict with colleagues due to email miscommunication. Email conflict tended to escalate quickly, often spurting messages that were interpreted as being aggressive. In these instances, participants chose to use an audio call to remedy the situation. Conference calls were also found to be an unsatisfactory technology to communicate with colleagues, as participants often did not know who was speaking or how receptive colleagues were to information shared by the participant, due to a lack of visual cues. The participants' preferred technologies for virtual work were those that provided visual or audio feedback. However, video conferencing technologies were rarely used. Participants felt reluctant to utilize video

conferencing technologies because not all employees from their companies are teleworkers and therefore may not understand how it could be beneficial.

Participants described feeling isolated in both social and organizational contexts in the workplace due to working remotely. Workplace relationships gave participants a sense of belonging in terms of being part of a team and working toward a common goal. Workplace relationships also offered participants' help or support, which was described as having a confidant to confer with for work related situations. While workplace relationships were important to the participants, they felt as though telework created challenges in fostering and maintaining workplace relationships. The main challenges were; conversations defaulting to task due to a general lack of social interaction, the amount of time it required to maintain relationships using communication technology, and difficulty promoting oneself due to the anonymous nature of telework. Participants revealed that informal conversations with colleagues did not occur while using communication technologies, as it would seem impersonal or inappropriate for the situation. Participants experienced feeling isolated, disconnected or forgotten by their peers, due to working remotely. Organizationally, they felt "cut off" from workplace culture and organization politics with "respect to crucial communications and contact with decision makers who can make or break their career" (Cascio, 2000, p. 83). Socially, they felt as though the camaraderie associated with working in an office with colleagues was lost, as "there is no perfect substitute for the stimulation, immediate feedback and fun of exchanging ideas face-to-face with other people" (Illegems & Verbeke, 2003, p. 121).

This study also set out to understand whether workplace relationships were linked to outcomes of productivity, job satisfaction, and job retention. This study suggests that isolation decreases job satisfaction. Organizational social support (perceived supervisor, co-worker and organizational support) has been found to positively affect job satisfaction (Bentley et al., 2016). However, while the participants were dissatisfied by the effect ICT had on communication with colleagues, and the isolation felt both organizationally and socially, these pitfalls seemed to be offset by benefits in increased productivity and work-life balance. This study did not make any conclusions about job retention.

Uses and gratifications theory and media richness theory were useful in providing insights into the experiences of virtual workers. This theoretical framework highlights the motivations for selecting types of ICT to communicate, as well as how ICT selections can affect communication. In reference to uses and gratifications theory, this study demonstrated that teleworkers utilize communication tools that allow them to fulfill a specific need like information seeking or personal relationships. The participants were very aware that using some types of technology over others would allow them to communicate more effectively to fulfill a need, and they used this knowledge in their day-to-day work. However, some technologies are more popular than others amongst colleagues, and this also had an effect on choice. In reference to media richness theory, the participants noted that informal communication between colleagues did not occur when using ICT due to it being less rich than face-to-face communication. This, in turn, "may impede employees' abilities to learn more about each other's background and personality" (Sias et al., 2012, p. 257). In addition, ICT like email and telephone conferencing were not ideal for equivocal messages between coworkers, and therefore

richer mediums like telephone, video, and face-to-face were preferred in these instances, as "rich media enable people to interpret and reach agreement about difficult, unanalyzable, emotional, and conflict-laden issues" (Daft & Lengel, 1983, p. 49).

This study advances the theoretical framework as it examines engineers who telework, a niche population in which communication is vital (Darling & Dannels, 2003). A modern perspective of ICT use by teleworking engineers, as it relates to U&G and MRT, was offered in terms of type of technology and the effect of ICT on communication.

Overall, the findings of this study are significant, as communication between colleagues is important for engineers' day-to-day work. In addition, the findings, specifically those related to isolation, may be surprising, as the participants occupied management roles. Management roles often allow individuals to influence policy and change within organizations. It is interesting that although most participants were dissatisfied with the telework arrangement due to feeling isolated from coworkers, they did not communicate actively seeking change to improve the arrangement. This study offers a modern snapshot of how engineers experience telework.

Limitations

From a design standpoint, the snowball method used to recruit participants may have prevented the researcher from recruiting participants from diverse networks. All participants were male, appeared to be close in age, and some were employed by the same company. This may have influenced why participants seem to have similar experiences. In addition, the study cannot make conclusions about any one specific type of engineer, as participants did not represent one type of engineer (i.e., mining engineer).

Two participants did not classify themselves as engineers, however they held similar roles to engineers.

From a logistical standpoint, the researcher often had to hold interviews via Skype video call, as it was not geographically feasible to interview them in person. At times, the Skype video would malfunction due to connection issues, which resulted in participants' thoughts being interrupted. Connection issues also made it difficult for the researcher to transcribe the interviews in instances where the recording was inaudible. Further, it may have been beneficial to be physically present within the workplace of each participant, as this could provide additional insight into the work environment.

Recommendations for Future Research

Directions for future research may include studies that examine teleworking engineers in management roles where ICT is frequently used in the management of employees. The National Board of Engineer Education and scholars, Darling and Dannels (2003) and Lappalainen (2009), stress how important communication is for engineers. The participants in this study supported these claims, however there was a fundamental shift in type of work, from manager to knowledge worker. It would be beneficial to understand how managers experience telework in terms of the effects ICT have on communication and perceived isolation. Further investigation is also needed to understand if the shift to knowledge work from management is a characteristic of telework for engineers and other types of workers.

As information communication technologies advance, research should continue to examine how newer ICT affect communication in organizations using the theories of uses and gratifications and media richness. Studies in which one technology is in focus may

produce a better understanding of how they affect communication in organizations. As Lee, Shin, and Higa (2007) point out, newer ICT, like video conferencing, "may not be as pervasive as email and telephones, and therefore making a sound judgment on their utility may be difficult" (p. 696). In future years, if newer ICT are more commonplace in the lives of professionals, it will be especially important to asses their effect on communication in organizations.

Practical Implications

This study aimed to provide recommendations for good practices for organizations that offer teleworking arrangements to employees. Based on the experiences of teleworkers in this study, three key recommendations can be offered.

The first recommendation is to use research based evidence to determine which ICT are most effective for geographically dispersed communication. These technologies should be made accessible to all employees, not just those working remotely. Participants in this study did not use ICT like video conferencing, as it was not widely accepted by members of the organization. It will be imperative that non-distance employees use the most effective ICTs when communicating with distance employees.

The second recommendation is to provide new distance workers with an orientation to telework, specific to the organization. Teleworkers in this study experienced anxiety upon starting to work due to a lack of guidance for technology use, lack of communication with colleagues, and insufficient resources to manage self-image. Organizations should outline expected use of technology, frequency of communication, and preferred reporting systems.

The third recommendation is to provide distance and non-distance workers with opportunities to develop both professional and personal connections to alleviate potential feelings of isolation, as found in this study. Opportunities may include facilitating more informal conversations while using ICT, as well as organizing company events where teleworkers are able to attend.

The experiences of teleworkers in this study have shown that information communication technologies can have a profound effect on interpersonal communication with colleagues. Further, ICT was found to inhibit interactions that are essential to ward off both social and organizational isolation in the workplace. Organizations have a key role to play in the improvement of virtual work arrangements for their employees. With more interest and support from organizations, telework has the potential to fulfill the needs of both the organization and the individual.

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Appendix A – Sample Consent Form

Title of Study: A Phenomenological Exploration of Engineers' Experiences using Communication Technologies in Telework

Researcher:
Gabrielle MacFarlane
Department of Communication, the University of Ottawa
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(xxx) xxx-xxxx

Supervisor:
Dr. Rocci Luppicini
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Invitation to Participate: I am invited to participate in the abovementioned research study conducted by Gabrielle MacFarlane. This research is being conducted for a Master's thesis, under the supervision of Professor Luppicini.

Purpose of the Study: The purpose of this study is to understand how information communication technology (video conferencing, e-mail, phone conferencing, phone calls, etc.) used in telework affects interpersonal communication in the workplace, on an informal (social and relationship building interaction) and formal (task and goal oriented interaction) level between engineering professionals. This research aims to contribute to the growing body of knowledge on the influence of telework on colleague based relationships, in an engineering context, to understand key challenges and opportunities associated with telework, and provide recommendations for good practices in the profession.

Participation: My participation will consist of attending one 1-1.5 hour audio-recorded interview during which I will be asked questions relating to my experience as a teleworker. Interviews will be scheduled at my convenience.

Risks: There are no known risks associated with my participation. I will discuss my experience as it relates to work process, as opposed to specific projects or assignments I am currently working on. I will not be asked any questions that threaten my professional wellbeing.

Benefits: My participation in this study will provide an opportunity for self-reflection in my experience as a teleworker. Additionally, I am taking an active role in contributing to important research, which will benefit not only myself, but also other teleworkers and organizations to better understand the role of relationships in an effective virtual workplace.

Confidentiality and anonymity: I have received assurance from the researcher that the information I will share will remain strictly confidential. I understand that the contents will be used for research purposes only and that my confidentiality will be protected by the use of pseudonyms, as well as by using pass codes and locks on physical documents and computers files containing interview transcripts and personal information. **Anonymity** cannot be fully protected as I am participating in face-to-face interviews with the researchers, however I have been assured that only the researcher will know my name and employer – any identifying information I reveal in the interview will be blocked out when interviews are transcribed.

Conservation of data: The interview data (tape recordings and transcripts) will be kept in a password-protected file on the researcher's laptop or in a locked drawer in the researcher's desk, in which only the researcher will have access to for the durance of the study. Once the student has been completed and the student has graduated from the program, the data will be conserved for five years. During this time the data will be kept in the supervisor's University of Ottawa office in a secure location (locked drawer and password protected computer files).

Voluntary Participation: I am under no obligation to participate and if I choose to participate, I can withdraw from the study at any time and/or refuse to answer any questions, without suffering any negative consequences. If I choose to withdraw, all data gathered until the time of withdrawal will be destroyed.

Acceptance: I,_____, agree to participate in the above research study conducted by Gabrielle MacFarlane of the Department of Communication, Faculty of Arts, University of Ottawa, which is under the supervision of Dr. Rocci Luppicini.

If I have any questions about the study, I may contact the researcher or the researcher's supervisor.

If I have any questions regarding the ethical conduct of this study, I 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
Email: ethics@uottawa.ca

There are two copies of the consent form, one of which is mine to keep.

Participant's signature: *(Signature)* Date: *(Date)*

Researcher's signature: *(Signature)* Date: *(Date)*

Appendix B – Interview Guide

1. How would you describe your current position? And what does an average day consist of?

2. Has your work always involved some form of telework? Or was there a transition from a tradition office setting to an increasingly more virtual office setting?

3. Was the shift from tradition work to virtual work due to a change in the type of work you were doing?

4. Do you work with the same group of people within an organization to complete a task or is it with others from different organizations?

5. When telework became increasingly necessary for your job, how did you feel? Was there any anxiety over this change?

6. Did the company you were working for perceive the virtual office to be something that could be challenging? Did they do anything specific to prepare you for this type of work, perhaps some sort of training?

7. Can you describe how your work practices have changed since starting to telecommute (compared to working in a traditional office)?

8. Are you more productive? Would you get more work done in a traditional work setting, than in a virtual work setting?

9. What is your work setup like?

10. Did you experience a learning curve when you first began to use various communication technologies? Did you have someone to consult about this, perhaps a mentor?

11. If you were to be unreachable for an entire day, how would that reflect upon you as an employee? What do you think is expected of you from an accessibility standpoint?

12. Do you ever feel like you are constantly connected to your work? If so, how do you attempt to create distance from your work?

13. Do you try to create distance from your work?

14. What are some of the challenges associated with telework? Can you discuss in relevance to task, as well as maintaining workplace relationships?

15. Have you ever been unable to get the information that you needed for an assignment?

16. Have you ever had a situation where there was a conflict or disagreement about a project?

17. How do you think the lack of face-to-face time with your colleagues affects you're the quality of your work?

18. How important is having friends in the workplace for you?

19. In what ways do workplace relationships offer you support?

20. How often do you engage in out of work context conversation with colleagues? When does it usually occur and what technology is used?

21. When you need support for a task oriented problem, who do you seek help from and how? Have you ever experienced a communication breakdown in this context?

22. What are your preferred methods for communicating with colleagues for work purposes? How often do you use videoconferencing?

23. What is your experience with Skype or Cisco WebEx?

24. Do you use any "innovative" technologies in your opinion? Which do you prefer?

25. Overall do you feel that virtual work has been beneficial for you? In what ways?

Appendix C – Tables

Themes with their associated meanings:

Emotional Impact • No initial feeling of anxiety upon starting to telework • Negative feelings about telework started after telework began • Feeling disconnected or forgotten by peers • Feeling isolated from office interactions and organizational politics • Missing the colleague camaraderie associated with an office environment • Anxiety about lack of technical support, lack of human contact, and challenges managing self-image
Workplace Relationships • Workplace relationships promote sense of belonging to a team or organization • Workplace relationships offer social and organizational support • Difficult to maintain workplace relationships while teleworking • Informal communication does not occur when using ICT
Information Communication Technologies in Telework • Email can cause miscommunication • Email miscommunication is resolved using audio technology • Video technologies were rarely used • Video technologies were perceived to enhance communication • Telephone conferencing is not ideal due to not being able to follow the conversation and lack of feedback • Using appropriate communication technology for the work context
The Nature of Telework • Experienced a shift in type of work, from manager to knowledge worker • Increased productivity due to less interruptions • Increased flexibility due to better work-life balance • Lack of collaboration and creativity between colleagues
Telework and Connectivity • Feeling constantly connected to work via technology • Being constantly connected was a result of personal choice • Being accessible was important for work purposes and management of self-image • Boundaries for technology use were established with "switch off" periods
The Organizational Role in Telework • No orientation or training for telework • Lack of overall organizational support throughout the telework experience • Disconnect between teleworkers and non-teleworkers