Telecommuting and Creativity of Professional Employees in Software Developing Industry in Sri Lanka

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ABSTRACT

Telecommuting as an alternative job design is becoming increasingly popular across the globe. Although many aspects of telecommuting have been extensively explored by researchers, its impact on individual creativity is yet to be explored. Thus, we conducted a mixed-methods investigation to explore the telecommuting-creativity link. Study 1 revealed how telecommuting enhances and reduces creativity from semi-structured interviews with 17 professional software development employees. Guided by the insights of study 1 and the Identity Theory, study 2 was conducted to examine the effect of telework on the novelty and usefulness dimensions of creativity. Drawing on a survey of 246 professional employees, study 2 found that telecommuting impacts personal and team identity of an individual differently which in turn have varying impacts to the two dimensions of creativity. We discuss the implications of our findings for the future implementation of telecommuting.

Keywords: Creativity, Novelty, Personal Identity, Team Identity, Telecommuting, Usefulness

INTRODUCTION

Even though not popular as now, telecommuting has been in the limelight of management research even before the COVID-19 pandemic (e.g., Biron & Veldhoven, 2016). Telework, teleworking, telecommuting, remote working, and work from home are often used interchangeably (Hobbs & Armstrong, 1998) in describing "a work practice that involves members of an organization substituting a portion of their typical work hours (ranging from a few hours per week to nearly full-time) to work away from a central workplace—typically principally from home—using technology to interact with others as needed to conduct work tasks" (Allen et al. 2015, p. 44). While there have been investigations on various effects of telecommuting, its influence on creativity has come to the awareness of scholars in recent years (Naotunna & Zhou, 2018; Tønnessen et al., 2021; Vega et al., 2015).

Literature Review and Need for Exploratory Study

The link between telecommuting and creativity is immature, with minimal literature in global and Sri Lankan contexts. For instance, Vega et al. (2015) examined the different outcomes of telework. They found that telework positively relates to creativity in a sample of supervisors and non-supervisory employees from a large U.S. government organization. A study in Sri Lanka based on quantitative data found that the autonomy experienced in telecommuting is a reason for enhanced creativity of professional employees (Naotunna & Zhou, 2018). Apart from that, a very recent investigation found that employees' creative performance is affected by telecommuting during the COVID-19 pandemic among knowledge workers in Norway (Tønnessen et al., 2021). However, these studies lack theoretical and methodological rigor, thus, do not adequately comprehend the link between telecommuting and creativity. This background motivated us to conduct study 1 to capture fresh insights into participants' perceptions of telecommuting and creativity.

Study 1 – Method and Procedure

Study 1 was conducted employing the qualitative methodology with 17 purposefully selected participants who engaged in telecommuting and creativity requisite professions. These 17 participants represented 11 software developing companies in Sri Lanka. Data were collected before the COVID-19 pandemic (i.e., year 2018) through semi-structured interviews, approximately 45-60

minutes. All of the interviews were recorded with the permission of the interviewees by using an audio recording device. After that, all the recordings were transcribed verbatim by the researchers. Line-by-line coding was carried out to identify the open codes, categories, and themes. Analyses resulted in two themes; the ways of telecommuting enhance and reduce creativity. The codes, categories, and themes are reported in Appendix A.

Study 1 - Findings

Participants' Views of How Telework Fosters Creativity

Participants revealed how autonomy, positive affect, better environment, unique thinking, and retained knowledge of telecommuting could enhance their creativity.

Autonomy & creativity

Respondents highlighted that telework provides autonomy in various forms, including freedom to take small breaks, freedom in scheduling work, freedom to prioritize work, and freedom to work independently. They viewed enhanced autonomy since teleworking enables them to come up with new ideas and solutions in their jobs.

Positive affect & creativity

Several participants revealed that they experience positive feelings towards telework. The positive feelings were described through the means of comfort, reduced stress, happiness, and a good mood. Also, they revealed that those positive feelings helped to engage in creative thinking.

Better environment & creativity

Respondents highlighted that teleworking at home provides better conditions when compared to the office environment. They revealed that a home environment is a relaxed place, facilitates the better flow of ideas, reduces disturbances, creates a relaxed mind, helps to save time, and helps to refresh and, in turn facilitates the creativity of teleworkers.

Participants' Views on How Telework Hinders Creativity

More demands & reduced creativity

Some of the participants revealed that they encounter more demands in teleworking. They explained that increased demands from both home and office, increased communication with the office, increased demands from office, and increased home demands prevent them from engaging in creative thinking.

Negative affect & reduced creativity

Some of the respondents revealed that they feel some negative feelings towards teleworking. They interpreted negative feelings in forms of felt isolation, insecurity, boring, tension, and unhappiness. They viewed the negative feelings resulting from teleworking prevent them from coming up with creative ideas and solutions in their job.

Participants' Views on How Telecommuting fosters the Novelty Aspect of Creativity

Unique thinking and ability to generate novel ideas

Participants revealed that relatively individual working mode at telework enhances their thinking as it is less susceptible to the influences and perspectives of others. The unique thinking was possible by having time for self, the ability to work in own style, and the ability to think in own style.

Retained unique knowledge and ability to generate novel ideas

Some participants revealed that teleworking is a good option to retain unique knowledge and self-expertise rather than exchanging unique knowledge with others. According to the participants' views, teleworking helps develop and retain unique knowledge through reduced pressure for knowledge sharing, retaining individual expertise, and developing self-expertise.

As far as the dimensions of creativity are concerned, these views provide evidence for the role of telecommuting in enhancing the novelty dimension of creativity which involves the newness, uniqueness, and originality of an idea.

Participants' Views on How Telecommuting Hinders the Usefulness Aspect of Creativity

Reduced interactions as an obstruct of generating useful ideas

Some participants believe that face-to-face contact cannot be replaced with telecommunication. They revealed that teleworking disadvantages are reduced with face-to-face contacts, communication difficulties, missed informal communication, reduced team interactions, and reduced participation in meetings and discussions. The views of the participants revealed that reduced interactions hinder the ability to develop more useful ideas.

Reduced knowledge sharing as an obstruction to generate useful ideas

Participants revealed that telecommuting reduces the opportunity to learn from others, opportunity to improve ideas, ability to get others' views, and feedback. In particular, participants highlighted that reduced knowledge sharing could reduce the usefulness dimension of creativity of teleworkers. These views align with the usefulness dimension of creativity, which refers to developing more practical ideas and solutions.

Study 1 - Summary

Study 1 found that telecommuting has both favorable and unfavorable outcomes on creativity. On the one hand, there are creativity boosters of telecommuting such as flexibility, the experience of positive feelings, a better environment and, reduced interactions supporting unique thinking. On the other hand, more demands, negative feelings, reduced communication richness were revealed to be the telecommuting-related impediments of creativity. Accordingly, our study findings report paradoxical views on the link between telecommuting and creativity. Intriguing curiosity and resolving the paradoxical views to a certain extent, our findings also provide basic evidence that telecommuting seems to be supported by generating novel ideas. However, it limits the usefulness aspect of creativity. Finally, study 01 concludes the importance of considering the two forms of creativity (i.e., novelty and usefulness) further exploring the telecommuting and creativity link.

Study 2 - Background and Purpose

Based on study 1 and evidence from the literature, the purpose of study 2 was to examine how does telecommuting impact two dimensions of creativity of professional employees. We mainly drew the insights of identity theory and existing literature of telecommuting and creativity conceptualizing the causal effects of study 2. Identity theory is an appropriate theoretical lens in understanding the effect of identity on individual behavior. Identity theory postulates that how people define themselves based on personal and social aspects (Tajfel, 1982) and they view him or her as a unique person apart from the person's team and to be an effective team member while maintaining conformity towards the group (Randel & Jaussi, 2003). These different types of identities have differential impacts on organizational outcomes (Burke, 1991). Thus, the insights of identity theory have been applied arguing employees' engagement in telework which may affect employees' identity, leading to different outcomes on the novelty and usefulness dimensions of creativity.

Study 2 - Theory and Hypotheses Development

Impact of telework on novelty dimension of creativity through personal identity

Researchers argue that working in a telework context can contribute to personal identity in three ways. Personal identity is the "sense of self-built up as the person embarks on and pursues projects or goals that are not thought of as those of a community, but as the property of the person" (Hewitt, 1997, p. 93). First, Teleworkers face barriers to communicate with organizational members due to the spatial and temporal barriers (Hinds & Bailey, 2003). Such weak relationships can reduce conformity and group thinking (Perry-Smith & Shalley, 2003). Second, when telecommuters feel losing the team identification, they look for alternative identities (Thatcher & Zhu, 2006). When the organizational identity is impossible, the other related identities would be family identity or extra organization-related identity. However, it is more important for professional employees to develop a personal identity than the other forms of identities since it would be pretty easy to be unique in achieving their career goals. Third, teleworkers tend to engage in new routines and habits that would help to view them in a new way, altering their organization-related identities (Thatcher & Zhu, 2006). For instance, telecommuters make their own schedule and try engaging in unique activities given the time savings. In

addition, individuals work in private settings, social identities are less likely to be activated. As such, telework context can activate the personal identity of an individual rather than the team identity.

Novel and original thinking require deviating from existing norms rather than confirming existing views (Amabile, 1988). The personal identity reflects the individual's idiosyncratic characteristics that allow them to think uniquely and divergently (Haslam et al., 2000). A person who is with personal identity would challenge the routines and find groundbreaking solutions. Activating an individual's unique characteristics fosters original thinking rather than activating a mindset influenced by others' perspectives (Nouri et al., 2015). Furthermore, I priming (i.e., a similar concept to personal identity) can be a good source of ground-breaking thinking against we priming (Mok & Morris, 2010). As such personal identity should be a better predictor of the novelty aspect of creativity.

Accordingly, in above researchers, argued that personal identity positively impacts the novelty aspect of creativity. On the other hand, it has also shown the extent of telework positively impacting personal identity. This chain of relationships shows that telework can positively impact the novelty aspect of creativity through the enhanced personal identity as a result of teleworking. Accordingly, we developed the following hypotheses;

H1a: EOT positively impacts the novelty aspect of creativity

H1b: Personal identity mediates the effect of the extent of telework on the novelty aspect of creativity

The impact of telework on usefulness dimension of creativity through team identity

Telework context can weaken organizational identification (Thatcher & Zhu, 2006). Teleworkers are less represented and reduced membership with the organization (Belle et al., 2015). Previous reviews noted that telework frequency could reduce the related organizational identities (Bailey & Kurland, 2002). Therefore, more engagement in telework will reduce the team identity, which is considered a specific type of organizational identity. Team identity refers to the "knowledge of his membership of a social group (or groups) together with the value and emotional significance attached to that membership" (Tajfel, 1978, p. 63). Team identity reflects the values or desires

of the person which have been derived as a result of the interactions with the team (Tajfel, 1978). When the person's group identity is salient, individuals' creativity is directed towards prevailing group norms and the group's desires (Haslam et al., 2013). By and the large team focuses on practical and functional aspects of creativity (Somech & Drach-Zahavy, 2013). As a result, a person with a higher team identity would elaborate more on the appropriateness or usefulness of an idea. As shown above, the extent of telework can negatively impact team identity due to employees' physical and psychological separation from the collocated context. The reduced team identity denotes the lack of perspectives and suggestions in improving the usefulness aspect of the creativity. This chain of relationships shows that the extent of telework can negatively affect the usefulness aspect of creativity as a result of reduced team identity involved in telecommuting. Consequently, we propose;

H2a: EOT negatively impacts the usefulness aspect of creativity

H2b: Team identity mediates the effect of the extent of telework on the usefulness aspect of creativity

The conceptual framework of the study is depicted in Figure 1.
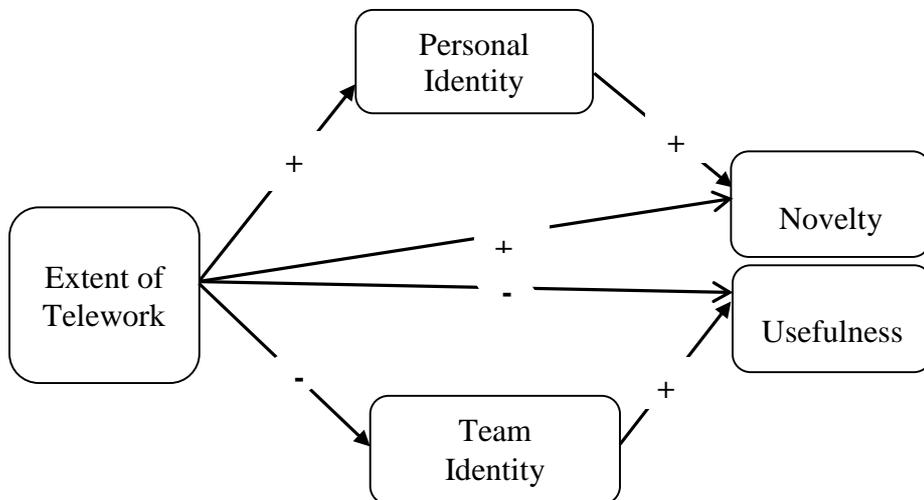
Figure 1: Conceptual Framework

Study 2 - Participants and Procedure

The present study specifically selected the software industry in Sri Lanka since the software development process requires a high level of

creativity. In addition, the study participants were professional employees who work in software developing companies in Sri Lanka. A professional employee produces IT-related outcomes as the main job function (SLICTA, 2007). The population of the present study should be the professional employees who work in the telework facilitated software developing companies in Sri Lanka. However, there is no clear evidence to find a list of software developing organizations that provide telework for their employee. Hence, it was not possible to develop a sampling frame by including all the items of the population. As a result, there is no ground to go for the probabilistic sampling. Therefore, study 2 opted for purposive sampling in selecting organizations that offer telework for their employees. We selected sixteen (16) software development companies that allowed teleworking for their employees by the time of data collection. The major software developing companies in Sri Lanka were included to assure fair coverage of the industry. Professional employees who have been allowed to telework in these companies were considered as potential participants of the study. Accordingly, 550 were identified with the assistance of human resource professionals of those companies. Out of 550 questionnaires circulated and distributed, 246 usable questionnaires were received. Those 246 questionnaires were used in the final data analysis, yielding a response rate of 45%.

Measures

Following the original scales, the participants were instructed to rate the statements (except the extent of telework) on a seven-point Likert scale (where; 1 = strongly disagree; 7 = strongly agree).

Creativity – novelty and usefulness: Similar to Shalley et al. (2009), the present researchers also used self-reported creative measures. The novelty aspect of creativity was measured by using the scale (i.e., "I am a good source of novel ideas") developed by Madjar et al. (2011). Also, the usefulness aspect of creativity was measured by using the scale (e.g., "I am good at developing useful and practical ideas") developed by Madjar et al. (2011).

The extent of telework: In measuring telework, previous studies have utilized the extent of telework which is the time spent in telework (e.g., Gajendran et al., 2015). Therefore, in this study, the extent of telework was measured, asking participants to indicate the number of days (per week) spent in telecommuting.

Personal identity: Personal identity was measured by using the three-item personal identity scale (i.e. "I am different from my work team") developed by Ellemers et al. (1999).

Team identity: Team Identity was measured by using the four-item scale (i.e., ''I see myself as a member of my work team) developed by Doosje et al. (1995).

Study 2 - Data Analysis and Findings

The researchers conducted confirmatory factor analysis (CFA) in Amos 16.0 version to assess the measurement model. All the construct reliability (CR) values were well above 0.7, and the AVE values were greater than the squares of inter construct correlations, confirming the presence of discriminant validity of measures. Taken together, the measurement model of the present study reported the required validity allowing the subsequent analysis. The measurement model reported good fit (e.g. $\chi 2/df = 1.33$, CFI = .99, RMSEA = 0.037, TLI = .98) indicating that the model adequately fit the data.

Reliability values, descriptive statistics, and correlation analysis

The Cronbach's Alpha values (reported within brackets), means, standard deviations, and the correlations between variables are reported in Table 1.

Table 1: Means, standard deviations, reliabilities, and correlations of variables

	N	U	PI	TI	M	SD
Novelty	(.86)				4.81	1.03
Usefulness	-.042	(.77)			5.69	.81
Personal Identity	.439**	-.068	(.83)		5.52	.72
Team Identity	-.288**	.313**	-.063	(.88)	5.56	.69
Extent of Telework	.477**	-.419**	.489**	-.435**	2.61	.86

** Correlation is significant at the 0.01 level (1-tailed); N – Novelty, U – Usefulness, PI – Personal Identity, TI – Team Identity

The results showed that extent of telework positively correlates with personal identity (r = .489, p < 0.01), and novelty aspect of creativity (r = .477, p < 0.01). Moreover, extent of telework negatively correlates with team identity (r = -.435, p < 0.01) and usefulness aspect of creativity (r = -.419, p < 0.01). Further, personal identity positively relates to the novelty aspect of creativity (r = .439, p < 0.01) and team identity positively relates to the usefulness of creativity (r = .313, p < 0.01).

Hypotheses testing – direct and mediating effects

First, confirming H1a, the extent of telework had a positive and significant effect on the novelty aspect of creativity (β = .42, p < 0.01). Similarly, the extent of telework had a significant and positive direct effect on personal identity (β = .41, p < 0.01), while personal identity had a positive and significant effect on the novelty aspect of creativity (β = .40, p < 0.01). Confirming the H1b, results revealed that the extent of telework had a significant and positive indirect effect on the novelty aspect of creativity through personal identity (β = .16, p < 0.01). Second, confirming hypothesis H2a, the extent of telework had a significant and negative direct effect on team identity (β = -.32, p < 0.01). Consequently, team identity had a positive and significant effect on the usefulness aspect of creativity (β = .18, p < 0.05). Confirming the mediating effect, results revealed that telework had a significant and negative indirect effect on the usefulness aspect of creativity through team identity (β = -.066, p < 0.01), by supporting hypothesis 2. Table 2 presents the results related to the hypotheses of the study.

Table 2: Results of Mediating Effects

Path	Estimate	S/E	P	Lower-Upper CL
Direct Effects				
EOT $\rightarrow$ Novelty	0.42	0.077	0.000	-
EOT $\rightarrow$ Usefulness	-0.32	0.060	0.000	-
Indirect Effects				
H1: EOT $\rightarrow$ PI $\rightarrow$ N	0.16	0.040	.000	.09, .25
H2: EOT $\rightarrow$ TI $\rightarrow$ U	-0.066	0.027	.017	-.12, -.01
Total Effect				
EOT$\rightarrow$ Novelty	0.59	0.069	0.000	-
EOT $\rightarrow$ Usefulness	-0.40	0.060	0.000	-

Note: N=246, Unstandardized path coefficients are reported. EOT – Extent of Telework, PI – Personal Identity, N- Novelty aspect of Creativity, TI – Team Identity, U – Usefulness aspect of Creativity

DISCUSSION, RECOMMENDATIONS, AND FUTURE RESEARCH DIRECTIONS

The respondents of study 1 revealed that the telework environment fosters their unique feelings, which in turn help to develop new ideas. In addition, it goes hand in hand with Thatcher and Zhu (2006) who extended insights on the telework context alters employees' identity, leading to different

job outcomes. Accordingly, when the employees engage in telework, they tend to develop unique working and thinking patterns, thereby developing personal identity. Hence, the present finding accords with the views of Thatcher and Zhu (2006) and goes beyond specifically showing that the teleworking environment fosters the personal identity. Also, the finding goes hand in hand with Nouri et al. (2015), who found that working relatively alone in a private context is beneficial for the generation of novel ideas since it helps individuals think more independently than working with supervisors and colleagues. The present study specifically focused on the telecommuting context instead of the 'private context' Nouri et al. (2015).

The respondents of study 1 revealed that the telework environment reduces the representation in the team environment, which blocks avenues to develop the usefulness of an idea. Overall, this finding suggests that the greater the extent of telework, the lower the usefulness of ideas developed by the individuals. Moreover, the study revealed that reduced team perspectives and representation cause this result as a result of engaging in telework. However, this finding goes together with Thatcher and Zhu (2006), who suggested telecommuting can reduce the organizational identity. Also, this finding empirically confirms the view that telework can reduce organizational related identities (Bailey & Kurland, 2002). Thus, this finding supports the importance of team interactions in improving the practical value of ideas. In addition, this finding reflects the view that individuals in a team context focus more on practical and functional aspects of creativity (Somech & Drach-Zahavy, 2013). Therefore, there is a possibility of getting the team's perspectives, which would enhance the usefulness of an idea.

Implications of the Study

Our study contributes to the extant knowledge in several ways. It confirms that telework has both favorable and unfavorable effects on creativity rather than taking an extreme view. Also, the findings provide valuable insights to reconcile the paradoxical views that exist about telework and creativity link. Further, this finding highlights distinct advantages associated with diminished interactions to heighten individual creativity, particularly the generation of novel ideas. In addition, the present study adds value to the remote working literature by unearthing two mechanisms through which telecommuting impacts individual creativity, expanding identity theory's insights. Third, the study found that telework does not have a uniform effect on creativity; instead, it has

a differential impact on the two dimensions of creativity. Therefore, this finding implies the importance of capturing the two dimensions of creativity rather than viewing creativity as one-dimensional concept.

The findings of this study provides implications for practitioners as well. First, the present finding informs the practitioners in software developing companies about the appropriateness of telework as a job design to enhance the generation of novel ideas for professional employees. In addition, the present study found that telework reduces the usefulness dimension of creativity of the professional employees who work in software developing companies. According to Golden and Veiga (2005), they exceeded an optimum level of telework and moved to extreme results in reduced job satisfaction. Accordingly, the present research findings imply the importance of balancing collocated work and teleworking to experience the unique advantages of both contexts.

Limitations of the Research and Future Research Directions

Notwithstanding the contributions, this study has some limitations to be acknowledged. First, the impact of telework on the dimensions of creativity will be varied as a function of individual differences. For example, the positive impact of telework on the novelty aspect of creativity will be diminished if the employee has an extrovert personality as he/she does not prefer to work in a socially isolated environment. In addition, telecommunication richness can also play a moderation role in between telework and creativity. However, our model does not capture those interactions. Therefore, future researchers may consider moderating effects in the link between telework and creativity. Second, the researcher collected data from professional employees of software developing companies industry in Sri Lanka. Hence, the generalizability of findings to other industries, other job categories, and other cultures is limited. Thus, we encourage research investigating telework's effect on creativity across industries, professions, and cultures. Finally, data collection of the present study was done before the COVID-19 pandemic. As telecommuting became more popular after the pandemic, floodgates have opened to researchers to investigate the same study in the new norm.

CONCLUSION

Individual creativity is a fundamental driver of subsequent team and organizational innovations. However, scant attention has been paid to investigate the effect of telecommuting, a modern job designing technique, on individual creativity. Given this background, grounded on qualitative and quantitative data, this study attempted to investigate the link between telework and individual creativity. In conclusion, the present study reported that telework has both positive and negative effects on the creativity of professional employees. Whereas teleworking helps generate novel ideas as a result of enhanced personal identity, it reduces the usefulness of ideas due to reduced team identity. Therefore, specifically, telework has a differential effect on novelty and usefulness dimensions of creativity. Finally, the present study sheds new light on both telework and creativity fields while integrating the two fields and setting the stage for further research in continuing the telework on the creativity journey.

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Appendix A: Codes, categories, and Themes identified from Study I Interviews –
Telecommuting related creativity boosters and impediments

First Order Codes with representative quotes with interviewee ID	Categories	Themes
Freedom to take breaks, freedom in scheduling work, freedom to prioritize works - *"I have freedom to take breaks as I want…I can decide the working time…new ideas come when I follow a schedule that satisfy my needs".(#2)*	Autonomy	creativity boosters
Comfort, Reduced Stress, happiness, good mood - *"In the office we spend much time at meetings and it is quite stressful. The home environment with reduced stress allows me to think the new ways and I am happily working. So, it is easy to think in different ways".(#1)*	Positive Affect	
Reduced disturbances, Relaxed place, relaxed mind, time savings, better concentration - *"We as software engineers need to find creative solutions and at home I can think new ideas since the home environment is free from troubles. The home environment helps to concentrate than in the office. Therefore, I can focus on new ideas and solutions easily at home environment". (#16)*	Better Environment	
Time for self, Ability to think in own style - *"When I work at home I can think my own without interferences. This is truly important to develop new ideas and solutions…I think all the good inventions are started in a mind of an individual. So it is always good to go deeper with me to find new ideas even though those are not perfect". (#5)*	Unique thinking	Novelty boosters
Keeping knowledge for self, reduced pressure for knowledge sharing, developing self- expertise –*WFH is a best option for working at least few days and to develop myself. Working away from the office environment supports to develop my own expertise help to develop new and different ideas".(#11)*	Retained Unique knowledge	
Increased demands from office, Increased home demands-*"It is hard to manage the pressures coming from both office and home that disturb the creative thinking.(#9)*	Work & family Demands	creativity Impediments
Felt insecurity, isolation, unhappiness, guilt - *The days that I work at home I feel like I am isolated from the office and from my team. It is a feeling like I am separated from my team. This creates tension within me and disturb bringing new solutions".(#14)*	Negative Affect	
Reduced face-to-face contacts, Difficulties in communication, Reduced informal communication, Reduced team interactions & Discussions - *"Solving problems require different viewpoints. This happens to me when I stuck in a problem. Although working alone can help to initiate new ideas more views are needed to improve those.(#8)*	Reduced Interactions	Usefuless impediments
Inability to learn from others, Inability to get others' views, Reduced feedback - *"The entire project is a team work… working from home for many days is not good for the final product. Lots of improvements can be done to my ideas through the knowledge sharing and working with others".(#10)*	Reduced Knowledge Sharing	

Source: The authors