

Analysing perceived communication and productivity of different office workers while working fully from home due to COVID-19 restrictions

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ABSTRACT

Background and aim – Due to the COVID-19 pandemic, people were forced to fully work from home under unique circumstances. Although working from home has several benefits, there are also many challenges regarding work-related communication, which are expected to have an impact on office worker's productivity. Therefore, this study is aimed to analyse how office workers perceived work-related communication while working from home during this pandemic, and how this related to their perceived individual productivity.

Methods / Methodology – The data are collected through a survey which was distributed between April and December 2020 among knowledge workers working at home due to the COVID-19 pandemic. The descriptive and bivariate analyses are based on data from 22.013 respondents.

Results – The results showed that generally people rate their productivity as positive. In addition, employees are positive about knowledge sharing and contact frequency while working from home. However, employees miss the spontaneous communication and people who are dependent on team work feel less productive, when working fully from home. In addition, people are moderately positive about the ease of communication with colleagues. People with (young) children and people who live alone perceived their productivity lower while working from home.

Practical or social implications – Since COVID-19, working from home has become more popular and is expected to stay more popular after this pandemic. This evoked reconsideration of workplace management strategies by many organisations. Insights in the perception of people regarding work-related communication while working fully from home, under unique circumstances, could help these organizations to improve communication facilities at home and at the office and eventually optimize work processes.

Type of paper – Research paper.

KEYWORDS

Teleworking; communication; productivity; COVID-19; office workers.

INTRODUCTION

Even though working from home (i.e. teleworking) is a hot topic at the moment, its origin dates back to the 1970s (Tavares, 2017). Telework can be defined as “*work that is performed from different locations (such as home) that enables workers to access to their labour activities by the use of information and communication technologies*” (Nakrošienė et al., 2019, p. 88). The term was first introduced by Nilles (1975) during the oil crisis in the 1970's, when it became clear that working from home could create work flexibility which in its own turn would create benefits for both organizations and employees. As a result, boundaries between working and non-working time become flexible while working from home. Over the last years, the popularity has risen even more since technological improvements created more possibilities to work remotely (Potter, 2003).

Throughout the last decades, the Netherlands has gained a leading position within the European Union on remote working, with 14 percent of the Dutch labour force working remotely within their organization in 2019 (European Commission, 2020). Since the COVID-19 pandemic in March 2020, there

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has been even a larger shift from working in conventional office environments to working fully from home, as the Dutch government requested to do so, when possible, in order to flatten the infection curve (Rijksoverheid, 2020).

Working (almost) fulltime at home and dealing with exceptional conditions (e.g. non-professional work spaces, lack of childcare, partner at home, social restrictions, and lack of ICT services) due to COVID-19, might also lead to many challenges related to perceived work-related communication and productivity. Therefore, it is interesting to investigate more in-depth how office workers perceived communication and productivity while working from home during the COVID-19 period. So far, research on the influence of (almost) fulltime working from home, under such unique circumstances, is still lacking. The main aim of this study was therefore to analyse people's perception of communication while working (almost) fully from home due to COVID-19 restrictions and investigate the possible relationships with perceived productivity. In addition, this study aimed to provide insight into personal differences regarding perceived productivity and work-related communication. The following section reviews the existing literature on perceived communication and productivity while working from home. Then, the data collection and methodology are described. In the fourth section the main results of the analyses are discussed. The final section contains the conclusion and discussion.

LITERATURE STUDY

Over the last years, the popularity of working from home has risen, even more since technological improvements created more possibilities to work remotely within organizations. However it most strongly increased recently due to COVID-19 restrictions (Guyot & Sawhill, 2020). Previous research showed that (part-time) working from home seems to have a positive relationship with productivity and work-life balance (Nakrošienė et al., 2019). For example, studies showed that working from home leads to positive changes in the daily schedule, such as a decreased commuting time and flexible working hours, which contributes to making knowledge workers feel more productive (e.g. Bosua et al., 2013; Raišienė et al., 2020). Another study showed that employees who regularly alternate their work environment between home and the office, reveal higher levels of well-being than the ones working primarily at the office or those working mainly from home (Beauregard et al., 2013). In addition, Butler et al. (2007) found that productivity of working from home employees did indeed rise compared to in-office workers, not only for a short term, but also over a period of three years. However, not all studies are very positive about productivity while working from home. For example, Lippe & Lippényi (2020) showed that individual and team performance decreased when more people worked from home. In addition, combining obligations from home and from work at the same time could also have a negative impact on people's productivity (Nakrošienė et al., 2019).

Besides productivity, working from home leads to many challenges related to communication. Communication is an activity that we humans perform every day, and is embedded in our interactions with other people (Marques, 2010). There are two different types of interaction at the work environment, namely work-related interactions (i.e. formal) and social interactions (i.e. informal) (Marouf, 2007). It is recognized that these social interactions (e.g. small talk) increases trust and support among office workers (Chevez & Aznavoorian, 2014), which eventually might lead to a higher productivity.

Communication can take place intentionally or unintentionally by exchanging thoughts and knowledge, and is not limited to verbal communication forms only (Mehrabian, 1972). It is recognized that verbal communication in combination with the presence of body language (i.e. face-to-face interaction) increases the impact of the message on the listener, enables direct feedback and improves the quality of information transferring (Zaremba, 2006). For example, Daim et al. (2012) suggested that absence of (non-verbal) communication can lead to anxiety, confusion and misunderstandings between employees. Therefore, more research is needed how people perceived communication opportunities, while working fully from home, under unique circumstances, due to COVID-19 restrictions.

An important form of work-related communication is knowledge sharing, which refers to providing know-

how and information on particular aspects in order to collaborate on solving problems, developing new ideas and implementing policies or procedures (Cummings, 2003; Pulakos et al., 2003). It is recognized that knowledge sharing is most effective through spontaneous face-to-face interactions at the office (Nghah & Jusoff, 2009; Wang & Noe, 2010), which is not possible when working fully from home. In addition, face-to-face interactions at work are important for sharing interests, rich information exchange and socializing (Sailer et al., 2016; Suckley & Dobson, 2014). If knowledge sharing is not possible (or optimal) due to COVID-19 restrictions, it is expected to affect individual productivity.

Besides proper communication, both individual and team productivity depend on ICT support while working from home (Bosua et al., 2013). Currently, a broad range of ICT communication tools are available for working from home, with the telephone as the oldest one. The advantage of phone contact is that a large exchange of (social) information can take place in a short time (Hinds & Kiesler, 1995). Another commonly used communication tool for working from home is e-mail (Smith et al., 2018). In addition, the use of instant messaging (e.g. WhatsApp, Messenger, chat MS Teams) for work-related communication is increasing, as it creates the opportunity for immediate feedback from colleagues and for multitasking (Wojcak et al., 2016; Zhang & Fjermestad, 2008). A communication tool, which has seen a big increase in users since the COVID-19 pandemic started, is the use of video communication. For example, the number of users of the video-call platform “Zoom” increased by 78% (Tilly, 2020). Despite this increased interest in (new) ICT communication tools, still little is known about the impact of using only ICT tools (instead of face-to-face communication) on an individual’s productivity.

Furthermore, previous research showed that there are several personal differences with regard to productivity and communication. For example, it is recognized that women more frequently use, but also better understand, non-verbal communication, which is more difficult while working from home (Hall & Matsumoto, 2004). Another study suggested that women prefer face-to-face communication over technology-based communication (Mano, 2013). In addition, Zhiyu & Krishna (2020) showed that women perceived their productivity lower during the COVID-19 lockdown. Besides gender differences, younger workers probably use and learn new (online) communication tools faster than older workers (Dunaetz et al., 2015). Several studies on working from home before COVID-19 showed that the average teleworker has a high education level and a high income (e.g. Hjorthol, 2006; Peters et al., 2004). A higher education level is possibly related to the use of ICT tools and complex tasks while working from home. So, people with a higher education level probably are more productive as they have more experience with working from home (Sarbu, 2015). Neufeld and Fang (2005) showed that having (positive) social interactions with family members during the workday was related to a positive perception of working from home and subsequently related to productivity. Moreover, women are more likely to only work when children are not around (i.e. structure their workday) and that men are shown to be more resistant to interruptions by family members (Huws et al., 1996).

Overall, it is assumed that perceived productivity is thus related to people’s personal characteristics and to how people experience work-related communication while working from home. Although working from home has several advantages regarding productivity, it is expected that communication (frequency, knowledge sharing and receiving support/ feedback from co-workers) is more difficult while working from home, due to the lack of face-to-face (informal) interactions and non-verbal communication. Therefore, this study aims to analyse how office workers perceived communication and productivity while working from home fulltime due to COVID-19 restrictions.

RESEARCH METHODOLOGY

Existing data was used, which was collected through a large survey-based Dutch collaboration project between 2 universities and 2 organisations from practice. The data was collected weekly in nine consecutive weeks among office workers of multiple organizations (i.e. mainly public organizations) in the Netherlands during the COVID-19 pandemic, starting in April 2020 up to the end of 2020. For the current study, a sub-survey from week 4 (22.013 respondents) was used, which specifically focused on communication. Data was collected on personal characteristics, perceived productivity and perceived

communication using an online survey. For data analysis only the cases that completed the full survey and reported their personal characteristics were taken into account.

First, respondents were asked to indicate the extent to which they are dependent on teamwork, followed by a question whereby respondents were asked to what extent they agreed with six items about sharing knowledge and experience, giving feedback and spontaneous knowledge sharing, based on a 6-point Likert scale, ranging from (1) disagree to (6) agree (see Table 2). Besides knowledge sharing, respondents were asked about the ease of communication, while working from home. They were asked to indicate to what extent they agreed with the following four items: “I discuss problems in the progress of the work directly in team meetings”, “I can easily approach colleagues with ad hoc questions”, “I know what colleagues from my team are doing” and “We coordinate the progress of the work on a daily basis”.

With regard to contact frequency, respondents were asked to fill in how often they have digital meetings with their team and supervisor while working from home, ranging from (1) once a month to (5) daily. In addition, respondents were asked about the communication tools they used. They could indicate whether they used the following tools (yes/no): email, shared documents, shared server, groupware programs (e.g. MS Teams, Groupware, Wire, or Slack etc.), video conferencing systems (e.g. Skype, Zoom, or Facetime etc.), telephone, instant messaging (e.g. Messenger or WhatsApp) and social media (e.g. Facebook, Twitter or LinkedIn). Furthermore, they were asked to indicate which of these tools they preferred for specific activities, such as providing general and existing information, solving a joint problem together and planning and monitoring. In addition, respondents were asked to rate their perceived individual productivity on a scale from 1 (low productivity) to 10 (high productivity). Finally, respondents were asked about their age, gender, level of education, household composition and age of children living in the parental house.

RESULTS

Sample descriptives

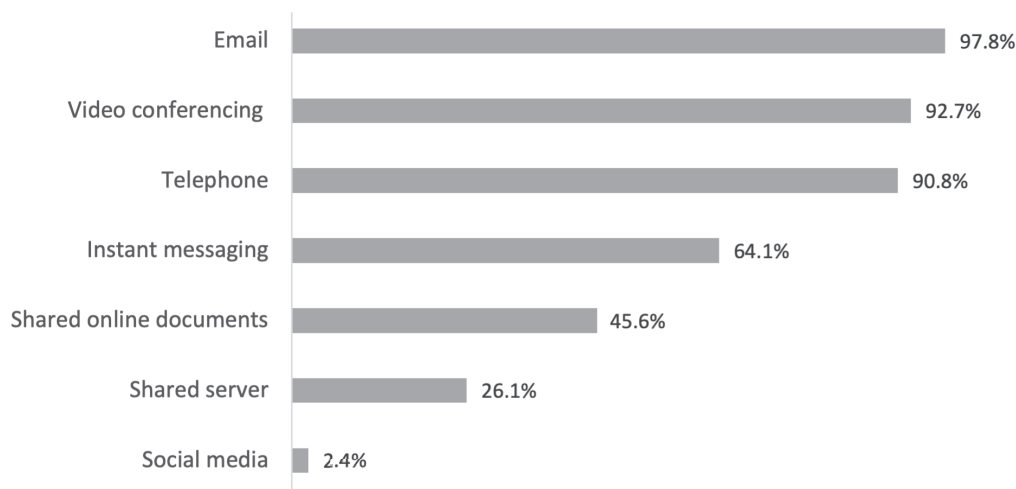
Table 3 shows the sample characteristics. As can be seen, men and women are almost equally divided. This sample consists of a large number of people (37.4%) aged between 51-60 years and with a high education level (i.e. bachelor’s and master’s degree programmes at HBO or University) (73.8%). Most respondents live together with a partner without (37%) and with children (38.3%). Among the respondents that provided the age of their children (18.3%) in the survey, the youngest child in the household is aged between 4-11 years (27.5%), 12-17 years (24.1%) or 18-22 years (33.4%).

Table 3 Sample characteristics week 4 (n= 22013)

Gender	N	%
Male	10305	46.8
Female	11596	52.7
Other	112	0.5
Age	N	%
≤30 years	1797	8.2
31-40	3495	15.9
41-50	4968	22.6
51-60	8227	37.4
> 60 years	3526	16.0
Education level	N	%
Lower education level	1489	6.8
Medium education level (MBO)	4090	18.6
High education level (HBO/ University)	16248	73.8

Other	186	0.8
Household composition	N	%
Single-person household	3545	16.1
Single-parent household with children living at parental home	1312	6.0
Couple without children (living at parental home)	8154	37.0
Couple with children (living at parental home)	8426	38.3
Other	576	2.6

Figure 1 shows that people most often used e-mail (97.8%), video conferencing systems (e.g. Skype, Zoom, or Facetime etc.) (92.7%) and telephone (90.8%) as communication tools. Social media (e.g. Facebook, Twitter or LinkedIn) is used only by a few people (2.4%) in the sample for work. Among the respondents, e-mail contact is mainly preferred for providing (80.5%) and requesting (82.7%) general and existing information. Moreover, e-mail contact is also widely applied to exchange information about a common problem (77.2%) and for planning and monitoring (61.6%). Telephone contact is preferred when needing (75.8%) or offering (60.3%) help to solve a problem both individually and collaboratively. In those cases, the possibility to share a large amount of information in a short time is seen as an advantage. This is also applicable for video conferencing, although this communication tool is more preferred when discussing a problem together (71%). Moreover, this tool is commonly used for presenting results (53.4%). When instant messaging (e.g. WhatsApp) is used for work-related communication, it is primarily used for suggestions to help other colleagues (27.4%).



Respondents rated their individual productivity during COVID-19 with a mean of 7.7 (out of 10) and a standard deviation of 1.19. With regard to contact frequency, most respondents are in contact with their team members at least once a week (61%) and with their manager or supervisor at least once every two weeks (64%). With regard to the ease of communication, the Cronbach's Alpha value of 0.722 indicates that the sum score of these items can be used for the analyses. Respondents were moderately positive about the ease of communication, while working from home, with a mean of 3.1 (out of 5) with a standard deviation of 0.76.

A Cronbach's Alpha of 0.613 showed that internal consistency is too low to sum the scores on the knowledge sharing items for the analyses. Therefore, a principal component analysis was performed, using Varimax with Kaiser Normalization as rotation method (see Table 2). Two components were distracted, namely (1) 'Frequency of knowledge sharing' and (2) 'Perceived absence of spontaneous

knowledge sharing'. Concerning knowledge sharing, the respondents are moderately positive too. With a mean score of 3.86 (out of 5), respondents are positive about the frequency of knowledge sharing while working from home during COVID-19. Nevertheless, they also agree that spontaneous knowledge exchange at the office is lacking with a mean score of 4.04 (out of 5).

Table 2 Principal component analysis knowledge sharing

Knowledge sharing items	Frequency	Absence	Component
I regularly share my knowledge and experience with colleagues	0.765	0.058	1
I approach my colleagues to gain knowledge and experience	0.737	0.125	1
I provide timely feedback to my colleagues	0.811	-0.093	1
I receive timely feedback from my colleagues	0.738	-0.091	1
I miss the spontaneous knowledge sharing 'at the coffee machine'	0.009	0.946	2
I miss the spontaneous knowledge sharing 'at the desk'	-0.008	0.947	2
Initial eigenvalues	2.330	1.827	
Percentage of explained variance	38.8%	30.5%	

Explorative analyses

Data was analysed using explorative bivariate analyses (i.e. ANOVA (*F*), t-test (*t*), Spearman (***p***) and Pearson Correlation (*r*)). Table 4 shows the results of the explorative analyses of the relationships between work-related communication opportunities and people's perceived individual productivity. As can be seen, all work-related communication variables are highly related to an individual's productivity. The lack of spontaneous face-to-face knowledge sharing encounters due to working fully from home, is significantly negatively related to perceived individual productivity. Other work-related communication opportunities, namely frequency of knowledge sharing (sharing and receiving feedback and knowledge), the perceived ease of communication and contact frequency with the team and the supervisor are significant positively related to perceived individual productivity. The use of additional ICT tools such as instant messaging, shared documents and social media, besides the commonly used traditional tools (i.e. e-mail and telephone), is positively related to people's individual productivity as well, while working from home.

As can be seen in Table 5, all personal characteristics are significantly related to individual productivity too. Women felt more productive while working from home during COVID-19 compared to other genders. Also, age was significantly positive related to individual productivity. The results suggests that people who are older feel more productive. In addition, the results show for household composition that people who are living alone feel the least productive (M= 7.55, SD= 1.29) compared to other households (M= 7.65-7.76, SD= 1.17-1.21). Regarding children in the household, people who are living together with two or more children feel less productive (M=7.51, SD= 1.23) compared to people with only one child (M=7.65, SD= 1.20) or no children (M= 7.70, SD= 1.20). Moreover, people with a higher education level (i.e. HBO or university degree) felt the least productive (M=7.61, SD= 1.21) compared to low (M= 7.79, SD= 1.24) and medium education levels (M=7.92, SD= 1.13). Considering the significantly positive relation between age of the youngest child in a household and individual productivity level, the results suggest that a higher age of the child results in a higher perceived productivity of the respondents. Finally, people who are more dependent on teamwork felt less productive during the COVID-19 pandemic.

Table 4 Results explorative analyses between work-related communication opportunities and people's perceived individual productivity

Pearson Correlation (r)	Sample (N)	Individual productivity		
Knowledge sharing				
Frequency knowledge + feedback	21248	$r=0.22^{**}$		
Lack of spontaneity	21528	$r=-0.29^{**}$		
Communication				
The ease of communication	19547	$r=0.35^{**}$		
Contact frequency				
With supervisor	18050	$r=0.11^{**}$		
With team	18404	$r=0.03^{**}$		
t-test (t)	Sample (N)	Mean	SD	Individual productivity
Communication tools (use yes/no)				
Instant messaging				$t=-10.04^{**}$
No	8411	7.57	1.257	
Yes	15958	7.73	1.155	
Shared online documents				$t=-8.57^{**}$
No	13091	7.62	1.221	
Yes	11278	7.75	1.157	
Shared server				$t=-3.82^{**}$
No	18022	7.66	1.203	
Yes	6347	7.73	1.166	
Social media				$t=-4.63^{**}$
No	23739	7.67	1.195	
Yes	630	7.89	1.125	

*** indicates that the coefficient is significant at the 0.01 level*

Table 5 Results explorative analyses between personal characteristics and people's perceived individual productivity

ANOVA (F)	Sample (N)	Mean	SD	Individual productivity
<i>Gender</i>	21826			$F= 95.10^{**}$
Male		7.56	1.244	
Female		7.79	1.147	
Different		7.41	1.312	
<i>Education level</i>	21826			$F= 79.27^{**}$
Lower education		7.79	1.236	
Medium education		7.92	1.132	
High education		7.61	1.205	
Other		7.81	1.114	
<i>Household composition</i>	21826			$F= 24.51^{**}$
Single-person		7.55	1.291	
Single-parent with children		7.76	1.206	
Couple without children				
Couple with children		7.76	1.170	
Other		7.65	1.174	
Spearman (ρ)	Sample (N)			Individual productivity
<i>Age</i>				
<i>Age youngest child</i>	21826			$\rho= 0.09^{**}$
<i>Dependent on teamwork</i>	3992			$\rho= 0.07^{**}$
	21545			$\rho=-.059^{**}$

*** indicates that the coefficient is significant at the 0.01 level*

DISCUSSION AND CONCLUSIONS

After COVID-19, it is expected that many office workers will continue working from home for a (larger) part of their work time (than before). The findings of this study show that people, under COVID-19 restrictions, still perceive their productivity as very positive (7.7 out of 10 on average). Although many people worked fully from home and did not have any face-to-face interactions with colleagues or managers, respondents were generally positive about the frequency of knowledge sharing (i.e. providing or receiving feedback/ knowledge). Further research is needed to analyse in more depth, whether people perceive their communication still positive when they work fully from home for a longer time.

On the other hand, many respondents agreed that they miss the spontaneous knowledge sharing at the office (i.e. desk or coffee corner). Previous research also showed that coffee areas and people's workstation are important for casual (informal) conversations (Hua et al., 2010). These conversations could lead to more trust among workers that eventually leads to more willingness to share knowledge (Chevez & Aznavoorian, 2014). Obviously, working fully from home makes it impossible to have casual and spontaneous face-to-face conversations, which in the long term could thus have an impact on productivity. For example, this could lead to misunderstanding, less trust and confusion among colleagues (Daim et al., 2012). The data analyses also showed that people were moderately positive about the ease of communication with colleagues while working from home. However, people who are dependent on teamwork were more likely to rate their productivity lower than people who are not dependent on teamwork. These findings suggest that working fully from home (i.e. no face-to-face communication) does not function that well for people who have to collaborate a lot with other team members. So, workplace managers should focus on creating workplaces at the office that enhance teamwork for these employees specifically.

As expected, the results showed that telephone, email and videoconferencing are used the most when working from home. In addition, the results showed that for each activity, people prefer different communication tools. For example, when people are solving a problem together, people prefer to use videoconferencing and seeing each other. It is recognized by Waizenegger et al. (2020) that communication via video-conferencing, instead of meeting each other physically face-to-face, is more efficient, purpose-driven and focused. However, that study also found that many virtual meetings could lead to an increased number of people who are feeling fatigued, as these meetings are more attention-taxing compared to face-to-face meetings. Further research is also needed to analyse the effects of virtual meetings, due to working from home, on people's mental health conditions (e.g. sleep quality, mood or stress etc.). Overall, a good balance between efficient virtual meeting and face-to-face meetings is necessary to enhance the productivity and wellbeing of office workers. Therefore, workplace managers and facility managers should focus on creating and implementing (enough) hybrid meeting solutions at the office to optimize the balance between physical- and virtual meetings.

Results of this study also suggest that when people more frequently are in contact with and share knowledge with colleagues and their supervisor, they also feel more productive. Previous research also showed that not being present at the office creates a lack of visibility and difficulties of managers to assess their employees' productivity (Lippe & Lippényi, 2020). Thus, regular contact with colleagues and supervisors should be stimulated within an organization.

Last, several personal differences were found regarding perceived productivity. People who are living together with (young) children or are living alone perceive their productivity lower while working from home. Contradicting to previous studies, the results showed that women perceived that they were more productive compared to men. Although previous research showed that women prefer face-to-face communication over technology-based communication (Mano, 2013), they probably feel more productive, because of the decreased commuting time and flexible working hours (Raišienė et al., 2020).

Although this study showed interesting results with regard to perceived communication and productivity, there are still some limitations. The sample consists of a large number of older, public workers and

is focused on the situation in the Netherlands. In addition, data was collected during a very unique situation, whereby many people were non-voluntary working from home. Future research could increase the generalizability of the results by using a more heterogeneous sample among office workers from different countries. In addition, it would be interesting to find out if the results differ when people are working for a longer period (voluntary) from home.

Results of this study, with regard to people's perception of communication and productivity while working from home, could help organizations restructure their workplace management strategies. Another contribution of this study is that it uses a very large dataset gathered during the COVID-19 pandemic, which provides novel insights in current challenges in workplace management.

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