**The Effects of Work-from Home set-up on the Perceived Productivity of Employees Living in Rural Areas in Zambales due to COVID-19**

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**Introduction**

The Coronavirus pandemic has hit all countries worldwide (Liu et al., 2020). Since the announcement of the World Health Organization of the global pandemic back on March 11, 2020, all countries, including the Philippines, have placed strict measures to curb the spread of this virus, from the mandatory wearing of face masks, strict social distancing, the rapid development of vaccines, limitations to transportation, strict curfews, and the implementation of compulsory remote work in all industries (Oneyaka et al., 2020). In response to the announcement of the World Health Organization recognizing Covid-19 as a pandemic, the National Government of the Philippines, on March 16, 2020, has placed the whole of Luzon Island under strict quarantine to avoid the further spread of the virus to the neighboring islands. (Vallejo & Ong 2020). This mandatory lockdown has forced all organizations in Luzon to let their employees work from home (Vallejo & Ong 2020), thus keeping their organizations running while keeping their employees safe from the virus while also following government quarantine protocols. While the government initially intended this lockdown to be short-lived due to the negative economic impact of halting almost all forms of transportation(Zhang et al., 2022), this imposed lockdown has placed the island of Luzon in one of the world's longest Covid-19 lockdown(See, 2021).

This pandemic forced organizations of all sizes in Luzon and in the whole Philippines to invest vast amounts of their resources on training, equipment, and manpower to improve and secure its IT capabilities to adapt to this very abrupt change due to the effects of the pandemic, this is evident in the sudden rise on communications and hardware spending compared to 2019 in the Philippines("Philippines - Information and Communications Technology", 2021).

As stated by MBA Skool Team (2020) Work from home is described as a notion in which employees may carry out their responsibilities from their residences rather than commuting to their workplace. Employees may do their jobs from the comfort of their residences with the help of technology pre-approved by their respective organizations, including video conferencing programs for their meetings, instant messaging tools for contact with their co-workers, office productivity software and customer relationship management software. While this Work-From-Home arrangement has been in use before the COVID-19 outbreak, this was only applied to a very few employees before the pandemic, with only 20% of employees whose jobs could be done remotely work from home (Parker et al., 2020).

While the work from home setup before the pandemic was only optional, this pandemic has forced organizations to adapt work-from-home, regardless of their industry, current business situation and/or geographical location and whether their respective organizations are in urban or rural areas they must fully or partially adapt remote work to keep their employees safe from covid infection, only allowing essential employees to work on-site (Macaraeg, 2020). To keep employees productive even when working remotely, companies must ensure that they have the proper telecommunication skills training, equipment, digital infrastructure and management support (Afrianty et al., 2022). Keeping ICT accessibility during implementation of remote work is integral for the survival of organizations even in rural areas. While generally, rural areas have improved their access to services, employment, education, and housing during the past years, rural areas still have problems regarding education and poverty (Salinas & Sanchez, 2009). In the Philippines, around 52% of people still live in rural areas (The World Bank, 2022). Rural areas still lag far behind their urban counterparts in developing technological adaptations and educational systems (Salinas & Sanchez, 2009), which are important factors for employees productivity in remote work.

Based on a previous study on worker productivity in work-from-home arrangements by Ramos and Prasetyo (2020), "Work-From-Home Factors" such as comfort levels in their home office, self-scheduled work time, avoiding commute, avoiding distracting co-workers and balancing house-work had a positive effect on employee productivity and job satisfaction.

While largely the current work from home setup was a derivative of negative circumstances, with approximately 30% of workers stating that their career and family life had suffered (Tušl et al.,2021), a lot of unintended positive outcomes from this new work set-up have arisen, such as reduced stress and increased work performance due to non-participation of workers in commuting from their homes to their places of work (Beck & Heshner, 2021), also 10% reported that their work had improved and 13% reported that their personal lives had improved(Tušl et al.,2021).

According to Ma and Ye (2019), commuting distance between work and home is directly proportional with the number of absent days for both health and other reasons, thus short-distance commuters are more productive in their work than their long-distance travel and long commuting time counterparts. Thus, their study proved that lesser commute times to work results in better-perceived employee performance. If the commute to work were removed and work-from-home setup was allowed, it can be assumed that it would provide a better impact on perceived employee productivity than on-site work. Part of these unintended consequences were because roads in urban cities where the majority of office workers live have low traffic speeds and high pedestrian traffic, the same cannot be said in rural areas where roads have high speed traffic and have small pedestrian traffic (Chodur et al., 2016).

Based on research done by Sadick et al. (2020), Indoor Environmental Quality (IEQ) factors such as office lighting, ventilation, thermal comfort, room acoustics, and privacy positively impacted the productivity of professionals in the workplace. Thus, improving the quality of employees' work environment both on-site and remotely would positively affect their job satisfaction and work productivity.

According to a study done by Afrianty et al. (2022), it is emphasized that before implementing a work from home set-up, employers must provide strong digital orientation and digital training to employees to sufficiently build their digital capabilities to work effectively, but due to the sudden mandatory implantation of work-from-home, companies must train their employees digital skills while they are working remotely.

While anecdotal data suggests there are a lot of improvements that needed to be done in terms of improving our telecommunications infrastructure both in urban and rural areas, rural areas are far behind their urban counterparts in terms of telecommunications structure (Salinas & Sanchez, 2009).  This is further emphasized in a case study done by Simpson et al. (2003), where they found out that while both urban and rural areas suffer telecommunication downtime, the significant distances between the residence of workers and the service centers and the unavailability of customer service in rural areas means that telecommunication issues are much more significant in a rural context. While city-based workers also experience these difficulties, centrally located support staff and locally available network service centers can generally resolve them fairly readily.

Studies have shown that the health of workers is a significant factor in employee productivity. According to a study done by Oakman et al. (2020), there are several factors that affect both the mental health and physical health of employees in the workplace. These factors are; the amount of organizational aid available to workers, the amount of colleague support, the amount of social interaction (outside of their company duties), and the amount of work-family conflict. These factors all had a substantial effect on health outcomes. The study also found out that when women worked from home, they were less likely to have better health outcomes both mentally and physically. In order to optimize the influence of WFH on employee health, more critical and comprehensive system factors must be included in the optimization process.

According to a study conducted by Wu & Chen (2020), information based work could be done electronically, and productivity could be measured by considering both the major skills involved in the work of the employee and the tools used. Different tasks productivity on different professions thus could be measured the same by categorizing it in listening, speaking, reading, and writing using both traditional ways and electronic devices and could be evaluated using a five-point Likert Scale.

Most of the previous research shifted its focus on urban settings where respondents are generally located in urban residential areas. These researches focused on the impacts of various factors on employees productivity in work-from-home arrangements but omit discussions on the differences of the impacts on their rural and urban samples . While work-from-home arrangements gives the freedom to employees to work in the comfort of their own homes, there are major differences in urban and rural areas that might affect work productivity, such as distances of homes to support centers or lack of telecommunications infrastructure, which could potentially have a great impact on worker productivity and performance (Simpson et al., 2003).

Based on previous studies and on the stated research gap, the researcher aims to achieve the following: 1. To determine which among the initial factors have significant effect on workers’ productivity in a work-from-home set-up in rural areas of Zambales; 2. To recommend some possible solutions to alleviate the impact of these factors to productivity of workers.

This study could assist organization management, employees, government policymakers, and future researchers in exploring the viability of remote work setups in rural areas. The management and administration of organizations utilizing work from home setting would have a clearer understanding of their workers doing remote work situated in rural areas as compared to workers residing in highly urbanized areas. This would help them utilize their resources more and help them come up with specialized plans for their workers.

For employees working remotely in rural areas, the study could bring them awareness of the factors that would have a significant impact on their work. Thus, giving them the ability to pre-determine whether remote work is appropriate for them or not. For the policymakers, this study would guide them to identify the enablers of remote work in their respective areas and create policies to help ease the burden on the organization and its employees. Future researchers may utilize the relevant findings of this study in conducting similar research.

This research was mainly concerned with identifying the primary factors that influence the productivity of work-from-home workers during the COVID-19 pandemic in rural parts of Zambales, as well as developing feasible solutions that might mitigate the potential effect on their production. There are certain drawbacks to this research. The first drawback is the total number of responses that are used in this research. The second aspect to consider is the number of factors that the researchers identified that influence employee productivity might be incomplete. Finally, the research exclusively looks at workers who work in rural regions in the province of Zambales. Future studies may look at other factors that influence an employee's productivity and survey a larger number of workers in various rural regions around the Philippines.

**Chapter 2**

**Research Methodology**

**Conceptual Framework**

Dependent Variables

Productivity Factors/

Independent Variables

Work Arrangement

Environmental Factors

* Internet Connection
* Distractions
* Commute
* Work Environment Comfort

Work-From-Home Arrangement

Personal Context Factors

* Work-Life Balance
* Handling of Personal Responsibilities
* Workload-Housework Balance

Perceived

Productivity

* Reading and Writing Tasks
* Listening and Speaking Tasks

Stress Factors

* Work Related Burnout
* Work Related Stress

Rural Environment

Social Factors

* Colleague Socialization
* Work Communication
* Intimidating environment

Health Factors

* Mental Health
* Physical Health

**Figure 1.** Conceptual Framework of the Study

Figure 1 Shows the Conceptual Framework of this proposed research study. It shows the study's identified variables taken from previous research, these variables include: Health Factors, Environmental Factors, Stress Factors, Personal Context Factors and Social Factors. The focus of the research would be on determining what are the effects of each of these factors on the perceived productivity of workers in work-from-home arrangements in rural areas in Zambales. The researchers would then compare these factors to three perceived work productivity variables using Multiple Regression Analysis. Table 1 shows the definitions of each of the 15 independent variables and the three dependent variables used in the study.

**Table 1. Definition of Factors and Factor Loadings**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Factor | Description | Input Factors | Factor Code | Sources |
| Personal Context Factors | This factor describes the work-life balance and handling of personal responsibilities outside work of employees | * Work-Life Balance * Handling of Personal Responsibilities * Workload – Housework Balance | * PCF1 * PCF2 * PCF3 | Ramos & Prasetyo 2020  Ma L & Ye R. (2019) |
| Stress Factors | This factor describes the stress, depression and anxiety levels encountered by employees in the workplace. | * Workload Burnout * Workload Stress | * StF1 * StF2 | Ramos & Prasetyo 2020  Salazar et al. (2021) |
| Environment Factors | This would describe the comfort levels encountered by workers in their home office or on-site office, including temperatures, distractions, and availability of digital resources and equipment | * Environment Distraction * Commute Satisfaction * Work Environment Comfort * Suitability of Environment for Productive Work * Internet Connectivity | * EF1 * EF2 * EF3 * EF4 * EF5 | Sadick et al., (2020) |
| Social Factors | This factor would describe the effects of isolation and co-worker communication due to the pandemic | * Colleague Socialization * Work-Related Communication * Occurrence of workplace Intimidation | * SoF1 * SoF2 * SoF3 | Salazar et al. (2021) |
| Health Factors | This factor would describe the physical and mental availability of workers to work productively in their jobs | * Suitability for work of physical health * Suitability for work of mental health | * HF1 * HF2 | Boles et al., (2004) |
| Productivity | This describes the productivity level of employees | * Listening and Speaking Related Tasks * Reading and Writing Related Tasks * Presentation Tasks | * Y1 * Y2 * Y3 | Wu & Chen(2020) |

**Data Gathering**

The researcher will disseminate the online survey to 300 participants. The data collection for the project will be done via the use of systematic sampling and snowball sampling utilizing digital survey technologies such as Google. The responder will fill out an online survey produced by the researcher, and all names and other personal information will be kept confidential and anonymous. The following are the selection criteria for respondents: They must be between the ages of 18 and 60, be of any civil status, be of any gender, and have at least six months of experience in their present position. The survey will include questions that will assess the respondent's prior experience and understanding of the issue in question. Respondents may recommend the online survey to their colleagues who have a similar background (snowball sampling).

**Research Locale**

The researcher would distribute survey questionnaires to 300 respondents within the research locale to employees whose jobs could be done working from home that are living in the following municipalities: Iba, San Felipe, Masinloc, Botolan, Castellejos, Sta Cruz, Candellaria, San Narcisso and Palauig using online means. All of these municipalities located within Zambales fall under Class 2 Municipal Classification thus fall under the category of rural ares.

. The researcher used Zambales as the research locale because it locates Olongapo City, one of the very few (5) Highly Urbanized Cities within Luzon and outside Metro Manila (Mapa D, 2021), it is also home to Subic Bay Freeport Zone, a previous American military base that was converted into a Freeport Area in 1992, it is also home to the Hanjin Subic Bay Shipyard which prior to its closing in 2019, produced shipping vessels and oil-tankers and helped place the Philippines as the fifth largest shipbuilder in the world (Tsunashima, 2014). Thus making, Zambales an ideal place to study work from home in rural setups because of the strategic location of a Highly Urbanized City within the vicinity of Class 2 and 3 provincial territories.

**Statistical Treatment of Data**

The research study would have three phases in the span of its statistical treatment of data, this is done in order for the researcher to achieve the goals of this research study. The first phase of the statistical treatment of data is the application of

***Phase 1 – Determining The Significant Factors***

The first part of the statistical treatment of data is allocated for the execution of the first objective – “To determine the significant factors that affect workers in a work-from-home setting who live in rural areas in Zambales”. To accomplish this goal, the study would interpret the data using Multiple Regression Analysis(MRA). Due to the nature of perceived work productivity as a multi-factor dependent variable, all 15 factors determined in the RRL would be used at once and would not be checked independently from one another (unlike Correlation Analysis). The 15 factors would be compared three times using three different work task type (Listening and Speaking Related Tasks, Reading and Writing Related Tasks and Presentation Related Tasks)

***Multiple Regression Analysis***

The main statistical analysis that the study would utilize is Multiple Regression Analysis (MRA), MRA would determine the level of significance of each of the factors that were identified from previous literature by checking its *p*-value. If the *p*-value of the factor is more that 0.05, we could conclude that the identified factor is not significant. Using MRA would also determine whether a factor has a positive or negative effect on the productivity of the worker, if the value of the factor has a negative coefficient, then the factor has a negative effect on the dependent variable and if the factor has a positive coefficient then the factor has a positive effect on the dependent variable. (Petchko, 2018)

The formula of the Multiple Regression Analysis is shown in Equation 1.

|  |  |
| --- | --- |
|  | **(1)** |

Where in:

The study would have three dependent variables; thus this study would have three models on understanding the productivity of workers with work-from-home arrangements.

Equation 2 shows the resulting Regression Model from Minitab on the relation of the factors to productivity on listening and speaking related tasks

|  |  |
| --- | --- |
| *y1= + PCF1 X1 + PCF2 X2 + PCF3X3 +StF1X4 + StF2X5 + EF1X6 + EF2X7 +EF3X8 + EF4X9 + EF5X10+ SoF1X11 + SoF2X12 + SoF3X13 + HF1X14 + HF2X15* | **(2)** |

**Equation 2.** Resulting Multiple Regression Model for Listening and Speaking Related Tasks

Equation 3 shows the resulting Regression Model from Minitab on the relation of the factors to productivity on writing related tasks

|  |  |
| --- | --- |
| *y2= + PCF1 X1 + PCF2 X2 + PCF3X3 +StF1X4 + StF2X5 + EF1X6 + EF2X7 +EF3X8 + EF4X9 + EF5X10+ SoF1X11 + SoF2X12 + SoF3X13 + HF1X14 + HF2X15* | **(3)** |

**Equation 3.** Resulting Multiple Regression Model for Reading and Writing Related Tasks

Equation 4 Shows the resulting Regression Model from Minitab on the relation of the factors to productivity on presentation of work to clients and/or executives

|  |  |
| --- | --- |
| *y3= + PCF1 X1 + PCF2 X2 + PCF3X3 +StF1X4 + StF2X5 + EF1X6 + EF2X7 +EF3X8 + EF4X9 + EF5X10+ SoF1X11 + SoF2X12 + SoF3X13 + HF1X14 + HF2X15* | **(4)** |

**Equation 4.** Resulting Multiple Regression Model for Presentation Related Tasks

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**Survey Questionnaires**

|  |  |  |  |
| --- | --- | --- | --- |
| Factor | Question | Code | Supporting References |
| Personal Context Factors | I have a better work life balance when I work from home than working on site | PCF1 | Ramos & Prasetyo 2020  Ma L & Ye R. (2019) |
| I could handle my personal family responsibilities better when working from home | PCF2 |
| I could manage my housework/chores better when I work from home | PCF3 |
| Stress Factors | I feel stressed out when I work from home | StF1 | Ramos & Prasetyo 2020  Salazar et al. (2021) |
| I feel burned out when I work from home | StF2 |
| Environment Factors | I am more distracted in my job tasks when I work from home | EF1 | Sadick et al., (2020) |
| My commute/travel to work is easy | EF2 |
| My work space at home is comfortable | EF3 |
| I have adequate equipment provided by my employer to do my job when I work from home | EF4 |
| My network connection is adequate enough to make me productive in my job while working from home | EF5 |
| Social Factors | I socialize better when I work from home with my colleagues when working from home compared to working on-site | SoF1 | Salazar et al., (2021) |
| I communicate better about work-related tasks/duties when I work from home compared to working on-site | SoF2 |
| I feel less/not intimidated talking to my bosses when I talk to them when working-from-home compared to face-to-face communication and/or working on-site | SoF3 |
| Health Factors | My current physical health and fitness negatively affects my work productivity | HF1 | Boles et al., (2004) |
| My current mental and emotional health negatively affects my work productivity | HF2 |
| Productivity Factors | I create and write text and image based forms of communication better when working from home.  ex.  creating emails, drawing designs, calculations, writing software code, writing reports | y1 | Wu & Chen(2020) |
| I could understand and interpret text and image based forms of communication better when working from home  ex.  listening to meetings, understanding work related text messages,  reading reports, checking documents | y2 |
| I could communicate and present my reports, tasks and ideas to my clients and bosses better when working from home  ex.  presenting reports to boss,  submitting presentation to boss, presenting proposals to clients | y3 |