

Exploring Remote Work Environment Before and After the Covid-19 Pandemic Era

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Abstract

The quantitative study examined remote work environments before and after the coronavirus, emphasizing elements such as productivity, the mental health of workers, and technological adaptation. The researcher underpinned the study on the job demand-resource model on productivity, social support theory for mental health, and diffusion of innovation on technological adaptation. The results showed increased productivity and high technological adaptation in the post-coronavirus pandemic compared to before coronavirus. Accordingly, the respondents indicated more resource and tool allocation to support remote workers. However, remote workers indicated increased stress, and anxiety irrespective of improved mental health support from the employers. Nevertheless, there were limitations such as a relatively smaller sample size and response bias. Thus, the study recommended future longitudinal research that includes diverse samples to further explore the variables, address challenges, and optimize remote workplaces.

Contents

Abstract	2
1.0. Chapter 1: Introduction.....	6
1.1. Background.....	6
1.2. Statement Problem	9
1.3. Importance of the Study	11
1.4. Research Purpose or Aim	12
1.5. Objectives of the Study	12
1.6. Research Questions	12
1.7. Research Hypotheses	13
1.8. Theoretical Model.....	13
1.8.1. Job Demand-Resources Model for Productivity	13
1.8.2. Social Support Theory Underpinning Mental Health of Employees	15
1.8.3. Diffusion of Innovation Theory or DoI for Technological Adaptation Aspect.....	17
2.0. Chapter 2: Literature Review	18
2.1. Introduction	18
2.2. Productivity element of Remote Work Environment before and after Covid-19 Pandemic.....	19

2.3.	Mental Health Aspects of Remote Work	21
2.4.	Technological Adaptation Element of Remote Work before and after COVID-19 Pandemic Era	23
2.5.	Summary and Research Gaps	24
2.6.	Theoretical Framework of the Study	26
3.0.	Chapter 3: Methodology	28
3.1.	Introduction	28
3.2.	Positivist Philosophy and Paradigm.....	28
3.3.	Research Approach	29
3.4.	Research Strategy.....	30
3.5.	Research Design	30
3.6.	Population of the Study	30
3.7.	Sample Design and Sampling Technique.....	31
3.8.	Sample Size Determination	31
3.9.	Data Collection Procedures	31
3.10.	Study Determinants	32
3.11.	Methods of Data Analysis.....	32
3.12.	Limitations of the Study	33
3.13.	Research Ethics	33
4.0.	Chapter 4: Discussion of the Findings.....	34

4.1. Introduction	34
4.2. Demographic Results of Respondents	34
4.2.1. <i>Percentage distribution age of respondents</i>	34
4.2.2. <i>Percentage of the gender distribution of respondents</i>	35
4.2.3. <i>Percentage level of education of the respondents</i>	36
4.2.4. <i>Percentage work arrangement of the respondents</i>	36
4.3. Summary of Productivity in Pre-and Post-Covid-19	37
4.4. Summary of mental health analysis statements	39
4.5. Summary of technology analysis statement	41
4.6. Summary of comparison elements before and after Covid-19	42
4.7. Exploration of Hypotheses	47
i. <i>Hypothesis one: There is no significant increase in productivity at the remote work setting after coronavirus compared to the time before coronavirus.</i>	47
ii. <i>There is a reduction in stress among remote workers in post-coronavirus time compared to the time the pandemic because of clear boundary between work priorities and life and no isolation.</i>	48
iii. <i>Hypothesis on technological infrastructure</i>	48
Chapter 5: Conclusion	49
References	51
Appendix 1: Questionnaire	63

1.0.Chapter 1: Introduction

1.1.Background

Remote work is whereby employees work from other areas or locations instead of their usual physical office environment, especially working from home due to flexibility and the use of digital communication strategies (Reynold, 2007). Accordingly, remote work is a task that an employee can complete outside the usual work environment, using the internet and use internet or telephone, and video conferencing to communicate with supervisors and colleagues instead of physically visiting the usual offices to complete their assignments.

The remote work concept has tremendously changed in the past years pushed by the technology and the evolving practices in organizations. This concept first emerged in the 1970s when Jack Nilles who was then an engineer and a physicist introduced it using the term telecommunicating in 1973 in Los Angeles while working on a project to reduce the congestion of traffic (Sroka, 2018). The first remote work arrangement happened in a few sectors and relied on old gadgets such as fax machines and telephones. The prominence of remote work escalated in the 1990s with the introduction of the Internet and the use of personal computers. People began using emails as the main more of communication and enterprises began exploring the potential of remote work environments to lower the overhead costs and enhance the flexibility of workers. Remote work environments become common in the 2000s, especially in tech-savvy sectors. In such situations, enterprises such as Dell and IBM became the adopters, acknowledging the merits of workers when they have freedom and are flexible (Gajendran & Harrison, 2007).

Remote work trends continued in the 2010s pushed by the advancement in communication technologies such as cloud computing, video conferencing, and collaboration software. Companies and education institutions commenced using tools such as Slack, Skype, Microsoft Teams, and Zoom. However, the full adoption still experienced resistance from some companies because of challenges associated with management and production (Roa et al., 2022).

The remote working concept before the COVID-19 pandemic gained acceptance but still was relatively niche. A report by Gallup (2020) noted that remote working is on the rise with more employees engaging offsite. The data revealed that 39 percent of employers are involved in remote work environments in some capacity, revealing that they spend some of their working time away from their colleagues. The number increased to 43 percent in 2016 with the Social for Human Resource Management showing that the number tripled between 1996 and 2016 (Gallup, 2020). Gallup report further indicated that 54 percent of employees intend to leave for jobs that provide flexible work time. This shows that working in a remote environment is common and enterprises should embrace this concept to accommodate people from different backgrounds.

Remote work trends also rose in Europe and such varied in different nations. For example, Germany recorded 12 percent of remote workers before 2019 while countries such as Denmark, Finland, Iceland, and the Netherlands recorded above 30 percent of remote workers. Nevertheless, other nations such as Italy, Greece, and Romania had 5 percent and below remote workers (Arntz et al., 2020).

The coronavirus in 2020 forced many workers to operate from their homes. In such cases, many companies expanded their digital infrastructure and embraced remote work policies in Europe. Moreover, the European Commission acknowledged the significance of working

remotely to ensure the continuity of the economy and supported all the initiatives to increase the digital infrastructure and skills (European Commission, 2020).

Casey (2021) explained that remote working in Europe, especially the UK gained traction with high numbers of people working at home increasing from 27 percent in 2019 to 37 percent in 2020 with more workers in London alone most likely to work in their respective homes. Employees working at home noted that they value work-life balance as it greatly increases irrespective of challenges of collaboration (Casey, 2021). Moreover, 24 percent of companies showed that they are pursuing an increase in homeworking in the future with the communication sector promoting this concept at 49 percent (Casey, 2021). Separately, the study noted that more advertisements increased using terms such as working from home or 'homeworking' to attract more talent. Further, 85 percent of employees embracing homeworking value a hybrid concept that requires both working from home and in the office (Casey, 2021).

The post-corona virus era continues to witness increased usage of the remote working concept and it has become the main practice with companies adopting hybrid systems that use both physical offices and remote work environments. Lund et al. (2021) reported an increment in the occupation transition between pre- and post-COVID-19 which will further increase in 2030 with the USA leading the pack at 28 percent followed by Germany at 21 percent, the UK at 14 percent, China at 13 percent, France 12 percent, Japan 11 percent and Spain at 7 percent. Thus the overall transition in occupation will be 25 percent as of 2030 (Lund et al., 2021).

Accordingly, the COVID-19 pandemic led to the use of remote work environments and technologies that increased more exploration of Zoom, and Microsoft Teams among others.

A report by Gartner in 2020 showed that the remote work environment continues to expand with 48 percent of workers expected to remotely work at least part-time in the post-

pandemic era from 30 percent witnessed before the pandemic. This change requires refocusing on collaboration, digital dexterity evaluating performance management, and setting goals (Gartner, 2020). The trend is anticipated to increase with a focus on the mental health of workers as they require more support. In such cases, the employers should act as a social safety net to offer expanded resources for mental healthcare coverage to support the workers. This is important to help in solving issues, including loneliness, isolation, and blurred boundaries between home life and work life to control levels of anxiety and stress.

Remote work environments also exhibit increasing trends in terms of technological advancement as more companies invest in digital tools to enhance collaboration and communication. The pandemic has exhibited an increment in the passive collection of data, including tracking of usage of computers and monitoring internal communications. Despite such practices assisting in comprehending engagement and productivity, concerns regarding ethical aspects such as privacy and the extent of monitoring arise (Gartner, 2020). Such tools continue to assist workers in their respective tasks as they also learn new skills to ensure productivity. The report further continues to exhibit mixed aspects regarding productivity, distractions, and flexible work schedules while challenges continue such as maintaining work-life balance among employees.

1.2.Statement Problem

The COVID-19 pandemic brought much transformation to work with many companies transforming to remote environments. A remote work environment existed before the pandemic. However, the growth was a niche practice, limited to a few sectors, and promoted by communication tools such as video conferencing and emails. The onset of the COVID-19 pandemic led to rapid change when the governments imposed social distancing and lockdowns

which made the remote work environment conducive and preferred by workers in different companies. The abrupt change to the remote work environment brought critical aspects regarding the effects of the remote work environment on mental health, productivity, and technological adaptation. A comprehension of the impacts is important for developing effective remote work policies and practices to sustain the well-being of workers and productivity in the post-COVID-19 pandemic era.

First, there is a need to compare the productivity of remote work environments before and after the coronavirus. Despite studies before the pandemic (Gajendran & Harrison, 2007; Bloom et al., 2015) indicating that a remote work environment increases productivity by lowering time for commuting, and offering flexibility, other studies (Tavares, 2017; Bailey & Kurland, 2002) explained the challenges, including distraction from homes and lack of supervision. Companies during the COVID-19 pandemic adapted to remote working environments with studies indicating initial declines in productivity in such companies but quickly adapted to the remote work concept. Nevertheless, limited data require more investigation to offer more information on the topic.

Separately, the mental health elements of workers in the remote environment before and after the pandemic require more examination. The pre-pandemic studies showed that a remote work environment could enhance the work-life balance of employees and reduce the stress associated with commuting and office politics (Buffer, 2021). Besides, studies pointed out challenges such as lack of boundaries between personal life and work, and isolation, leading to burnout and stress. The COVID-19 pandemic worsened the challenges related to health as workers experienced longer moments of isolation and no boundaries between work and home

lives. Therefore, evaluation of the mental effects is imperative for the support system that can help solve adverse impacts and foster the well-being of workers in a hybrid work system.

Lastly, adapting to technology is important in remote work environments and has underpinned the evolvement of this work concept before, during, and after the COVID-19 pandemic. Before the COVID-19 pandemic, the remote work environment relied mainly on the basic tools for communication and their adoption was uneven in different sectors (Kane et al., 2021). The COVID-19 pandemic led to more technological advancement and spread in adopting digital technological tools, software for collaboration, and cloud platforms for communication and other operations. This change explains the need for continuous innovation and adaptation to ensure the efficiency and effectiveness of a remote work environment. However, limited information warranted further study to explore how technology impacts the work practices in remote environments to ensure the sustainability of the remote work model.

1.3.Importance of the Study

The present study is significant because it enables students, experts, and policymakers to comprehend how a remote work environment affects productivity, impacting the competitiveness and efficiency of companies. The current global contexts witness more companies embracing online and remote work environments for workers. Thus, comprehension of this aspect is important for the development of effective policies for HR to manage workers.

A focus on the mental health of workers is important, especially at the moment when companies grapple with the welfare of workers in the post-corona virus era. The issues such as poor development of boundaries between the professional and personal lives of workers are good for companies to develop strategies to assist in addressing challenges of burnout and stress which the present study will explore in detail.

The study explored the adaptation of technology in remote work environments. Accordingly, the information on the rapid adoption of technological platforms and tools in pre- and post-corona virus shows the potential challenges and opportunities for working in remote work environments. This helps companies with information on investments in the best digital tools for productivity and collaboration.

1.4.Research Purpose or Aim

The study aimed to explore the remote work environment before and after the COVID-19 pandemic era.

1.5.Objectives of the Study

The study further attained the objectives.

- i. To compare the productivity aspect of remote work before and after the Covid-19 pandemic era
- ii. To examine the mental health aspects of employees before and after the Covid-19 pandemic era
- iii. To evaluate the technological adaption aspect of remote work before and after the COVID-19 pandemic era.

1.6.Research Questions

The study achieved the aim and objective by answering the below research questions.

- i. How do the productivity levels among remote workers differ in pre- and post-COVID-19 pandemic?
- ii. What factors contributed to a change in productivity among remote workers in pre- and post-COVID-19 pandemic?

- iii. What mental health challenges do remote workers experience in a pre-and post-COVID-19 pandemic?
- iv. What support mechanisms and systems do companies offer to remote workers concerning their mental health in pre- and post-COVID-19 pandemic?
- v. What technologies dominated the remote work environment for workers before and after the COVID-19 pandemic?

1.7.Research Hypotheses

- i. There has been no significant increment in remote work productivity after the COVID-19 pandemic compared to the era before the pandemic.
- ii. There is a reduction in stress among remote workers in the post-COVID-19 pandemic compared to before era before the pandemic because of the clear boundary between work and life and no isolation.
- iii. There is no significant adaptation of technological infrastructure in the remote work environment in the post-COVID-19 era compared to the era before the pandemic.

1.8.Theoretical Model

The present study integrated the job demand-resource theory to explore productivity, the social support theory to explain the mental health aspects of workers, and the diffusion of innovation theory to explain the adaptation of technology in remote work context.

1.8.1. Job Demand-Resources Model for Productivity

Demerouti and colleagues 2001 established the job demand-resources or JD-R as a concept to assist in comprehending the productivity of workers by finding a balance or level between the demands of the job and the available resources. The concept applies to the remote

work concept which is relevant to the nature of job demands and the resources that change compared to the conventional office environment.

Job demand is the psychological, physical, organizational, and social elements of a job that need sustained effort and are aligned with the psychological and physiological costs. The context of remote work reveals how the demands manifest in different ways, including the increment in the workload because of blurred work-life boundaries, constant availability, and pressure to ensure productivity with minimal or no direct supervision (Demerouti et al., 2001). The outbreak and widespread coronavirus aggravated the demands as workers promptly adapted to the unique and new working environment and the governments implemented social distancing measures, and lockdowns. The work conditions shifted to remote work concepts which made workers change, translating to managing more personal responsibilities such as home-schooling and childcare (Hamouche, 2023).

Job resources entail different aspects such as psychological factors, physical aspects, social elements, and organizational factors that assist in achieving the objectives, lower the job demands, and foster the growth and development of workers. The resources in the remote work setting include accessibility to technology, support from the management, flexible working hours, and opportunities or chances for workers to enhance their skills. The quality and availability of the resources are important for the mitigation of adverse impacts of the job demands and increase productivity (Bauer et al., 2014). For example, enterprises that offered robust IT support and availed flexible work arrangements exhibited increased productivity of workers during the pandemic.

JD-R model postulates that finding a balance between the job demands and the resources defines the level of engagement and burnout of workers, translating to productivity. Accordingly,

high job demands with limited resources lead to burnout of workers and reduction of productivity. On the other hand, more resources buffer the effects of demand and increase the productivity and engagement of workers. Companies during the COVID-19 pandemic on more job resources such as offering support through a positive work culture, training workers to engage in remote work environments, and giving technological infrastructure suited for the new work environment, leading to improved productivity (Errichiello & Pianese, 2021).

The usage of the JD-R concept in this research is imperative because it explored the significance of a balanced approach to managing remote work environments. Change towards remote work concept brought benefits such as a reduction in commuting time and increased flexibility but came with challenges. Thus, the pandemic era explained a need for companies to reevaluate their support structures to effectively explore the challenges. For example, companies continue to ensure that workers have ergonomic home offices, provide virtual check-ins to offer support to workers, and offer strategies to ensure that workers have clear boundaries between personal life and work. This helped in balancing the demands and resources to enhance productivity.

1.8.2. Social Support Theory Underpinning Mental Health of Employees

Social support theory stresses the significance of associations and interactions to maintain the mental health of people. Cohen & Wills (1985) explained this model basing their argument on the significance of interactions among people and such is imperative in the remote work setting as it helps to explore how social support solves challenges such as anxiety, and stress and increases the well-being of workers.

The types of social support that people need range from instrumental, emotional appraisal, and informational aspects. Workers require emotional support that entails care,

empathy, and trust which assist in reducing incidences of isolation in remote work environments. Instrumental support entails tangible assistance such as help with activities or providing the necessary resources. Further, informational support includes advice and guidance while appraisal support entails affirmation and feedback.

Yang et al. (2022) indicated that COVID-19 led to abrupt changes to the remote work environment which reduced physical meetings and communication, increasing the feeling of isolation and stress among workers. The provision of social support helps in buffering the adverse impacts of reducing stress and providing belongingness. For example, continuous or regular virtual meetings, and interactions via video calls and creating an online communication system assist in improving emotional connection and improve mental health among workers.

A remote work environment poses challenges in the provision and access of social support for mental health. The limited spontaneous interaction in offices leads to a sense of isolation. Therefore, companies focus on proactive approaches to promote a culture that supports employees in remote work environments. The team-building activities on virtual platforms, programs for peer support, and mental check-ins help in narrowing the gap of interactions to reduce stress and isolation. Moreover, managers should acknowledge and recognize situations of mental distress and equip workers with skills that offer effective support to colleagues at lower ranks in management to improve their well-being (Ozcelik & Barsade, 2018). Remote work will continue in this post-COVID-19 pandemic era which makes it important to sustain social support systems for workers. Thus, the development of robust technological infrastructure and digital platforms for social interactions and communication, encouraging a work culture that enhances mental health, and integrating resources for mental health in policies are important for workers.

Accordingly, enterprises that embrace social support increase the well-being of workers and realize resilience and an engaged workforce.

1.8.3. Diffusion of Innovation Theory or DoI for Technological Adaptation Aspect

The diffusion of Innovation or DoI theory designed by Rogers in 1962 expounds on how companies adopt innovation in society for a period. The concept is important in understanding the adaptation of technology in the remote work environment in pre- and post-corona virus, especially when the pandemic spread globally (Rogers et al., 2014). The author indicated elements of DoI theory such as compatibility, complexity, advantages, observability, and trialability. Accordingly, the relative advantage is how people perceive the importance or benefits of innovation over conventional practices. The pre-and during the COVID-19 pandemic exhibited the merits of using remote work technologies such as ensuring continuity in operations irrespective of challenges such as lockdowns, especially during the pandemic. Technological tools such as Skype, Zoom, Slack, and Microsoft Team offer advantages in communication, enhancing flexibility and collaboration (Al Fadda et al., 2020).

Companies easily adopt innovations due to their readiness for adoption when such link to the experiences, needs, and values of companies. The compatibility of such technologies in remote environments with the needs of workers, flexibility, safety, and ensuring work-life balance enhanced the quick adoption during the coronavirus. Similarly, the perception of workers and companies on the difficulty in embracing or using innovations derailed their adoption. Accordingly, the user-friendly remote work technologies and the minimal technical expertise requirements attract more users. In such cases, organizations tend to invest in intuitive platforms and train workers for their usage, leading to increased adaptation of the technologies (Vyas, 2022). Further, the extent of experimenting with innovation before the full adoption

impacts its acceptance among users. The COVID-19 pandemic era offered a moment for forced trial moments for remote work technologies which led to experimentation and adoption as workers and companies experienced firsthand benefits (Rogers et al., 2014). Moreover, the observability underpinned by the visible outcome of using the innovation influenced its adoption. Companies realized the benefits of remote work technologies in ensuring improved productivity and collaboration during the pandemic as workers could communicate virtually using video conferencing techniques (Rogers et al., 2014). This encouraged more adoption.

DoI theory offered a framework for explaining the adaptation of technology in remote work environments but the presence of COVID-19 did not allow for a gradual adoption process as witnessed in the era before the pandemic. The accelerated diffusion compelled companies to address challenges associated with digital literacy, infrastructure, and cybersecurity. Besides, the sustained adoption of the technologies is underpinned by continuous investment in support, training, and developing digital competencies among workers (Venkatesh & Bala, 2008). The continuous evolution of remote work requires the implementation of the principles of DoI theory as a framework for the implementation of new techniques. A focus on the relative merits, ensuring compatibility with the needs of workers, simplifying the complexity, and providing opportunities for trials and observable advantages are important. Moreover, it is imperative to promote progressive and continuous learning and adaptability to support the long-run adaptation of technology and innovation within the remote work environment.

2.0.Chapter 2: Literature Review

2.1.Introduction

The section expounded on various studies underlying variables of remote work such as remote work, mental health aspects of employees, and technological adaption aspects. Besides, the section provides a theoretical framework that links the theories to the discussed variables.

2.2.Productivity element of Remote Work Environment before and after Covid-19

Pandemic

Productivity is significant when exploring remote work environments in companies. Productivity before the COVID-19 pandemic era brings debatable perspectives on whether remote work environments increased in hindered productivity. Experts provide different opinions and argue that a remote work environment led to improved autonomy and flexibility, translating to improved productivity and satisfaction at work before the outbreak of the coronavirus due to telecommuting (Gajendran & Harrison, 2007). However, skeptics are cautious about this notion by indicating that home distractions, lack of supervision, and communication challenges can cause adverse impacts on performance. Thus, studies provide mixed information on remote work productivity. Bloom et al. (2015) explored Chinese travel agencies and noted that workers on remote platforms experienced a 13 percent increase in performance compared to their counterparts working in physical offices. This study indicated that the improved performance happened due to a quiet work environment, reduced breaks, and sick days (Bloom et al., 2015). Nevertheless, it also outlined demerits such as the isolation of workers on such platforms, contributing to adverse impacts on job satisfaction and reduced productivity.

Separately, studies note the significance of organizational and individual factors in the determination of remote work productivity. Bailey & Kurland (2002) noted that telework inspired studies on urban planning, transportation, sociology, and law. The authors reviewed the literature and answered three questions regarding who participates in telework, the reasons for

such, and what occurs when they do such. The study indicated that workers who are highly disciplined and have strong skills in time management perform better in remote work environments. Therefore, companies invest more in robust collaboration and communication tools to ensure more engagement and productivity results in such environments.

The COVID-19 pandemic era led to a vast transition of workers to remote work environments and this offered more opportunities for the exploration of the productivity aspect of this work environment. Companies promptly adapted their technologies and processes with some indicating decline in productivity in the first stages but recovered with progressive implementation of remote working tools. PwC in 2020 realized that 83 percent of employers perceived that the change to a remote work environment was successful with 73 percent indicating that their workers were productive compared to the era before COVID-19 (Phan, 2020). Phan highlighted other studies on productivity before COVID-19 such as research by Stanford University on remote workers in 2013 that lasted for 9 months monitoring 16,000 call centers with workers who volunteered to work in remote work environments. The results indicated that there was a 13 percent increase in performance (Phan, 2020). The author further indicated another study on productivity at work conducted by Telework Research Networking, revealing that 47 percent of workers who opted to telework were very satisfied with the tasks compared to 27 percent of workers in physical offices (Phan, 2020). The Remote Collaborative Worker Survey affirmed that employees are more productive when they work in a remote environment with 77 percent of workers who engage in a few times in remote work per month reporting improved productivity (Phan, 2020). Moreover, Barreto et al. (2020) showed that a remote work environment improved the productivity of workers during the pandemic because of

reduced time wastage from commuting, reduced distractions in the office, and improved flexibility of the work schedules.

Despite the improved productivity of remote workers, the coronavirus also led to challenges as workers experience difficulties in separating their personal lives from work, leading to long working hours and burnout (OECD, 2020). Besides, there were disparities in the home office work environment, with some workers having inadequate equipment and space to effectively work. The long-run effects of a remote work environment on productivity are still an area under investigation as companies settle on hybrid working models. The enterprises focus on changing towards optimization of remote work policies and practices to sustain productivity. Important strategies such as offering workers with the required resources, ensuring a stronger organizational culture, and promoting work-life balance remain important.

2.3.Mental Health Aspects of Remote Work

Studies on the effects of remote work on mental health before the pandemic were narrow but explored both challenges and benefits. A benefit of a remote work environment on the mental health of workers before COVID-19 is the improvement of work-life balance. The remote work environment eliminated time for commuting and ensured improved flexibility enabling workers to manage their professional responsibilities and lives which reduced stress and increased their well-being (Gajendran & Harrison, 2007). Further, a remote work environment reduced stressors at the workplace, including interruptions, and office politics which contributed to positive mental health results. This is affirmed by a study by Mann & Holdsworth (2003) indicating that a remote work environment reduced stressors at the workplace such as office politics, and interruptions, leading to positive mental health results. The study explored that teleworking enabled workers to concentrate in a quieter and more controlled setting to reduce interruptions

that are witnessed in physical office settings. This freedom and autonomy assist employees in maintaining efficiency and improving in reducing stress linked with frequent disruptions. Further, a remote work environment reduces exposure to office politics (Mann & Holdsworth, 2003). The physical environment entails the exploration of challenges, social dynamics, and competition, leading to emotional exhaustion and stress. Teleworking reduces constant interactions and allows workers to concentrate on their activities without the added pressure of office politics. Moreover, the study indicated that teleworkers perceived improved job satisfaction and reduced stress related to work contributed by the work environment to ensure the well-being of workers.

Studies before the coronavirus in 2019 indicated the demerits of remote work on the mental health of employees. Remote workers experience stressful situations because of the increased levels of isolation due to reduced opportunities for interactions and engaging with workers. Tavares (2017) noted that remote workers have no time or limited time to engage with colleagues in face-to-face conversation which leads to their sense of loneliness. The isolation introduces the feeling of loneliness to contributes to anxiety and depression due to the absence of workmates as the teleworkers cannot mitigate or share the pressure emanating from work. The study also blurs the boundaries between home life and work life which worsens stress. The workers in remote environments engage in tasks for longer hours, leading to burnout which further impacts their mental well-being (Tavares, 2017). This is also affirmed by a study by Bailey and Kurland noting that the missing clear boundaries between home and work life leads to burnout, especially among workers who experience challenges in managing time and self-discipline (Bailey & Kurland, 2002). The advantages such as flexibility and autonomy may also lead to more stressors, especially poor time management and poor balancing of family

responsibilities with no support structure that physical work conditions provide. Despite telework increasing the work-life balance and reducing stress associated with commuting, it leads to the social isolation of workers and extends the working hours which causes adverse impacts on mental health, explaining the necessity to embrace strategy to solve the negative impacts. Buffer (2021) affirmed the challenge of loneliness and social isolation among workers in remote environments that increase due to low interactions with workmates and reduced social activities outside, leading to more disconnection with 27 percent of workers in remote environments experiencing loneliness in 2020 increasing from 20 percent witnessed in 2019.

2.4. Technological Adaptation Element of Remote Work before and after COVID-19

Pandemic Era

The adaptation of the technology regarding remote work is critical for companies before and after the COVID-19 pandemic. The era before COVID-19 exhibited remote work enhanced by different digital communication equipment but the change to work remotely during the coronavirus time led to important technological adaptations. Pyöriä (2011) noted that the remote work environment before the COVID-19 pandemic mainly focused on aspects such as instant messaging, emails, and video conferencing tools, including Skype which enterprises used to facilitate communication in a remote environment. The study also showed that diffusing telework as an aspect of technology was slower at the time as most of such technologies were concentrated in towns compared to other less developed areas, leading to different amenities and jobs outweighing the safety and quiet rural areas (Pyöriä, 2011). The spread of technologies underpinning remote work concepts also exhibited slow growth at the time due to the geographical challenges, and issues related to regional policies.

The emergence and spread of the COVID-19 pandemic made companies adopt remote work concepts and technologies. Many employees worked from home, companies realized the significance of adopting scalable, robust, and secure collaboration and communication tools. Kane et al. (2021) affirmed the above sentiment by noting that companies during the COVID-19 pandemic increased usage of technological platforms or digital tools for meetings, Wi-Fi, and restrooms for workers. Moreover, cloud-based platforms during the time enabled workers to access the resources of organizations, data, and applications from all areas to promote seamless operations in remote environments (Rosa, 2020). Rosa (2020) indicated that companies invested in SaaS and cloud software to support the transformation to digital platforms to increase their value at the time of COVID-19 which enabled a smooth transition of operations, ensuring scalability, efficiency, and innovation. Thus, companies focused on investment in the digital technology to ensure workers streamline their activities. Separately, COVID-19 also led to the establishment of new technologies for implementation at work such as the augmented reality and virtual reality tools that workers used for training, meetings, and collaboration to provide immersive experiences that narrowed the gap in interactions (Castrillon, 2021).

2.5.Summary and Research Gaps

The review explored various studies that expound on the elements of remote work before and after the COVID-19 pandemic era, focusing on productivity, mental health for workers, and technological adoption. Productivity is important in remote work environments for companies and studies before the pandemic give varied perspectives. Gajendran & Harrison (2007) stressed the telecommuting aspects before COVID-19 and promoted positive results such as improved productivity. Bloom et al. (2015) despite affirming the merits of remote work environments

before COVID-19 including improved performance among workers, and reduction in sick days also indicated demerits such as loneliness, isolation, and reduced productivity.

The COVID-19 pandemic brought a wider transition to remote work that offers new opportunities to explore productivity in the context. Enterprises quickly adapted processes and technology with some experiencing a decline in productivity but recovering and improving due to the progressive implementation of remote working equipment. Phan (2020) noted a study by PwC in 2020, revealing 83 percent of the employers considering a change to remote work a success with 73 percent noting that their employees were productive in comparison with pandemic eras. The pandemic despite its merits also led to challenges as workers experienced difficulty in separating their work and personal life which led to longer hours at work and burnout (OECD, 2020). Issues such as inadequate equipment, and space became significant challenges.

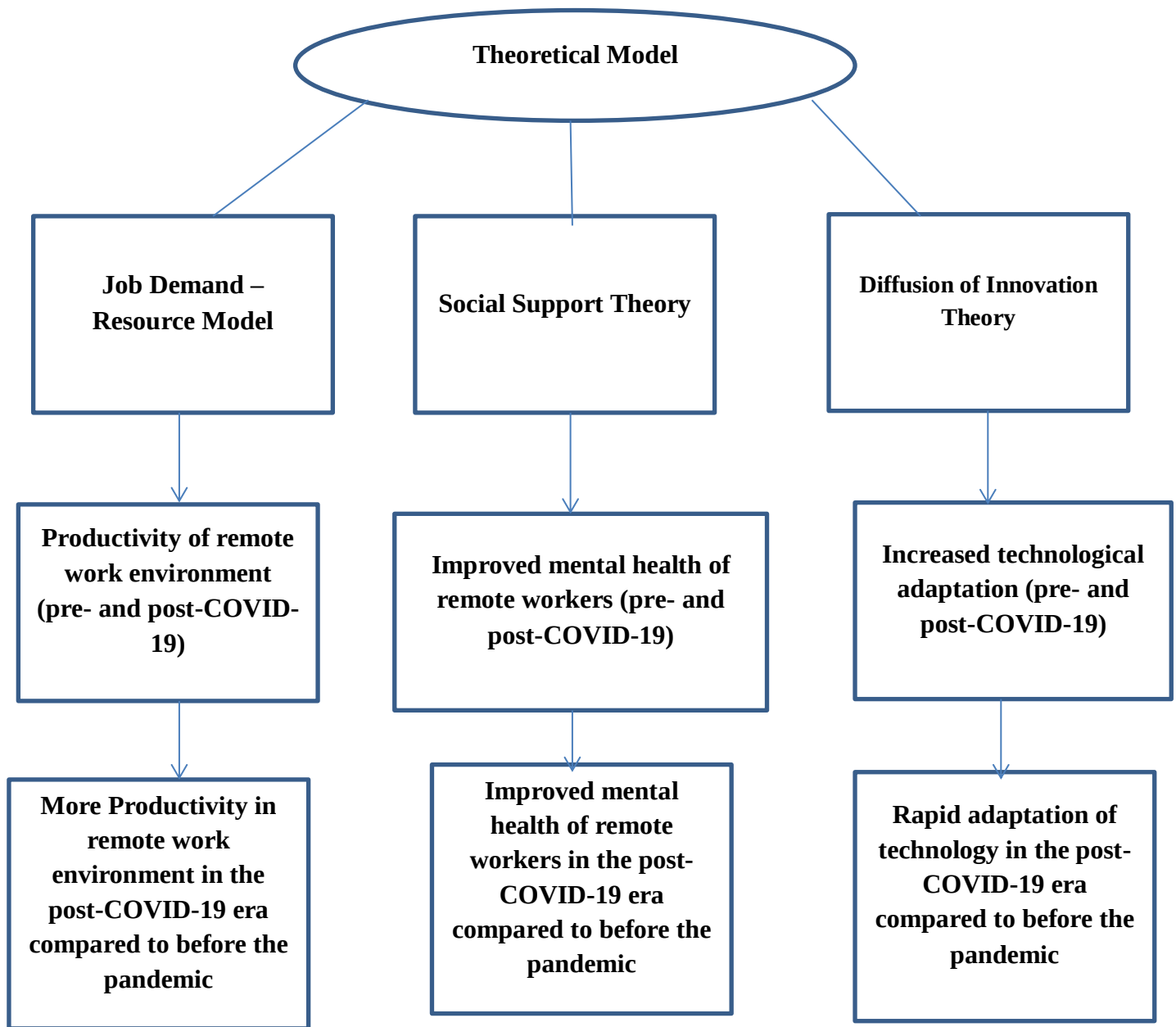
The mental health of the workers in the remote work environment, especially during the COVID-19 pandemic era has gained more interest. Studies before the pandemic on the mental health of workers were limited but explored the benefits and challenges. The improvement in balancing work and life was a benefit and the elimination of time for commuting and enhanced flexibility enabled the workers to effectively manage their personal lives and professional responsibilities to reduce stress and increase health (Gajendran & Harrison, 2007). Despite such significant drawbacks also arose as workers in the remote environment experienced isolation, loneliness, reduced face-to-face collaboration, and interactions, and no boundaries between work life and home life increasing stress (Tavares, 2017; Bailey & Kurland, 2002; Buffer, 2021).

The adaptation of technology also promotes the success of remote work in both eras before and after the COVID-19 pandemic. The era before the pandemic exhibited the use of

basic digital communication equipment such as the use of emails, instant messaging, and video conferencing to promote remote working (Pyöriä, 2011). However, there was a slow adoption of telework technology in less-developed regions. The emergence and spread corona virus enhanced the adoption of remote work technologies and companies acknowledged the need for robust, scalability, and secure collaboration tools. Thus, there was an increment in the use of digital platforms for communication and meetings (Kane et al., 2021; Rosa, 2020; Castrillon, 2021).

Several gaps remained unexplored in the reviewed study and such include the long-run impacts of remote work on productivity, especially in the hybrid model being not explored in detail. Accordingly, most studies focused more on short-run gains and more studies required assessing aspects regarding sustained productivity. Despite the different mental health support aspects implemented and explored, the studies have not explored the efficacy with no focus on the best practices that support the mental health of workers in remote environments for long-run well-being. Moreover, there was a need to explore the integration and user experience of technologies that companies adopted during the COVID-19 pandemic and their long-run viability. Thus, the identified gaps in the review warranted the study to further explore aspects such as productivity, mental health, and technology adoption before and after the COVID-19 pandemic.

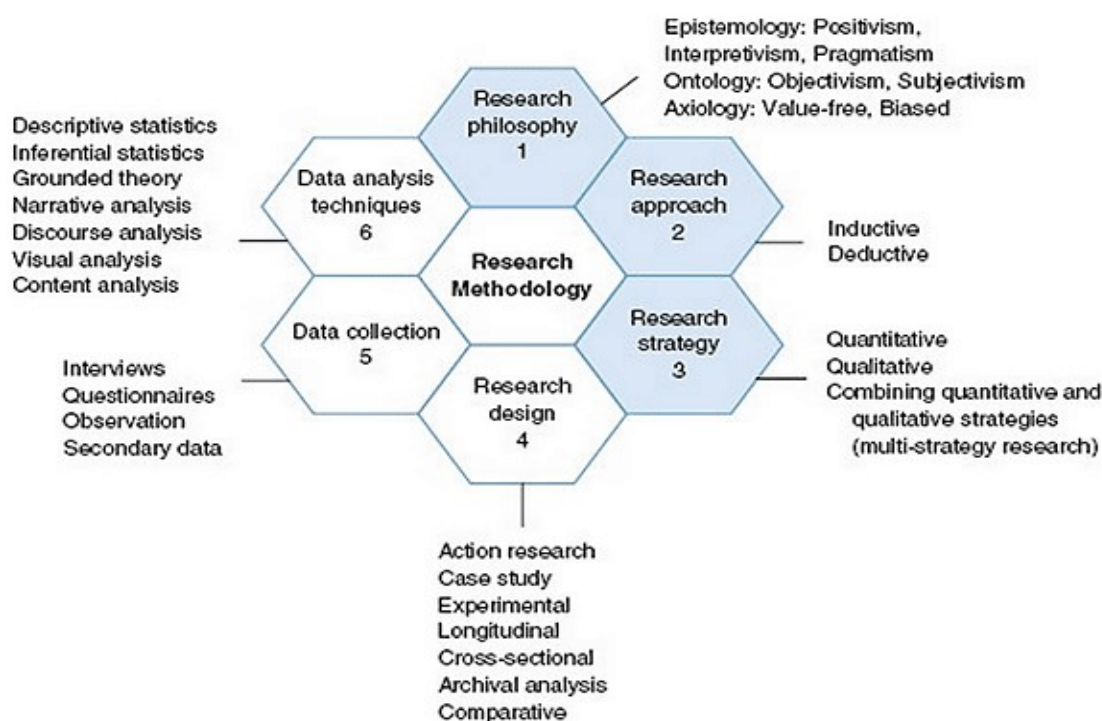
2.6.Theoretical Framework of the Study



3.0.Chapter 3: Methodology

3.1.Introduction

The study examined remote work environments before and after the COVID-19 pandemic. The section explored the research methodology and methods underpinned by positivist philosophy using the concept of Honeycomb below.



(Wilson, 2014).

3.2.Positivist Philosophy and Paradigm

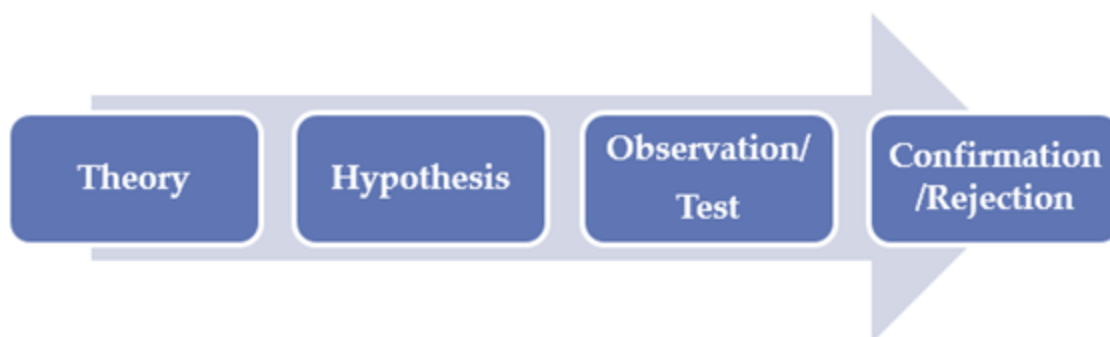
The present study was underpinned by positivist philosophy. Accordingly, the positivist philosophy promotes and advocates for the application of scientific methods in conducting a study underpinned by a gathering of facts or laws (Dudovskiy, 2022). In such cases, external factors such as social structures and institutions affect the behaviors of people. The researcher embraced this positivist philosophy because of the aspiration to engage in quantifiable observations that result in statistical analysis. Besides, the researcher used this philosophy due to

being independent with no human interests in the study process (Dudovskiy, 2022). The goal of the researcher explored the patterns and associations between the social factors to make accurate predictions regarding social and societal change. This was achieved using primary research methods such as surveys.

The study focused on pragmatism paradigms using the best-suited research method. The researcher will embrace the pragmatism paradigm based on the belief that reality changes amidst the flow of transforming situations (Ulz, 2023). Thus, the researcher used a framework that applies to the research questions under exploration. The present context required quantitative techniques to gather data.

3.3.Research Approach

The present study followed a deductive approach or reasoning because the researcher is concerned with developing a hypothesis or question underpinned by the existing theories and designing a research strategy to answer the objectives or questions. Accordingly, deductive reasoning commences from a particular concept to a general (Dudovskiy, 2022). When the link seemed to imply a given theory, it can be true in many situations. Accordingly, the researcher commences with a theory to create a statement problem and answer the research objectives based on the below framework.



(Dudovskiy, 2022).

3.4. Research Strategy

The study used a quantitative research strategy because it underpins methods for data collection. Dudovskiy (2022) explained quantitative research as a strategy that measures the occurrences based on calculations and numbers. The strategy entailed gathering of numerical data and exhibiting the perceptions of association between theory and research as deductive (Dudovskiy, 2022). The strategy allowed the researcher to gather quantitative data regarding the topic, research questions, and objectives. The study included different numerical data using different methods and statistical analysis to aggregate data. Moreover, the researcher used the strategy to measure the variables numerically to analyze the measurements using models and report the associations emanating from the variables.

3.5. Research Design

The present study compared remote work environments before COVID-19 and after the pandemic. In such cases, the researcher focuses on a survey research design which entails collecting data using a questionnaire that the researcher will distribute to the respondents or samples of participants (Jain, 2023). The survey entailed using questionnaires with Likert Scales distributed via mail and online platforms. Further, the study was a point in time underpinned by a cross-sectional timeframe (Wilson, 2014). The researcher decided to use survey design because it helps in explaining the characteristics of a larger population as it offers a wider capability to ensure an accurate sample to collect targeted results to conclude.

3.6. Population of the Study

The study recruited participants from Midocean University within the United Arab Emirates. The researcher engaged the respondents in the United Arab Emirates because it is a

cosmopolitan city with people from different backgrounds working online in various sectors or studying online in universities.

3.7.Sample Design and Sampling Technique

Sample design was the strategy and method that a researcher utilized to select subjects or respondents in a study process. Studies embrace either probability or non-probability sampling to select participants. The present study focused on the probability sampling technique, using a simple random sampling technique (McCombes, 2019). Simple random sampling assisted to identify and select 68 samples from Midocean University for an online survey. This process allowed each respondent a chance for inclusion in the study process. The study ensured the convenience of the research by selecting participants from the United Arab Emirates. The random selection of participants from the same university is imperative for the homogeneity of the population as the participants have the same or similar characteristics relevant to the study process. This was important to reduce bias and ensure that every participant has a chance to engage in the study.

3.8.Sample Size Determination

The study determined sample size scientifically using the formula: $n = \frac{Z^2 \pi [1 - \pi]}{(\text{error})^2}$ where n represented the sample size, π showed the highest variability at 50 percent or 0.5 and z was the value obtained from the Z score at 90 percent level of confidence. This gave a sample size of 68 participants when the calculation and substitutions are done as follows $n = \frac{1.65^2 [0.5]^2}{(0.1)^2}$. Thus, n was 68 respondents for the study.

3.9.Data Collection Procedures

The study embraced an online survey data collection process whereby the researcher distributed questionnaires online to the selected participants. The researcher opted for an online

survey because it was cost-effective and ensures that the researcher reaches a maximum number of respondents for a higher response rate (QuestionPro, 2024). The process was also easier as the researcher distributed the questionnaires via emails and social media, reducing time wastage. Moreover, it allowed for real-time collection of results during the study process.

3.10. Study Determinants

The key elements that impacted on the objectives of the proposed study were identified in variables such as productivity, mental health, and the adaptation of technology in remote work environments. The productivity aspect had job demands (the level of workload, feedback offered to workers, and expectations), job resources (accessing the technology, support from management, training of workers, flexibility in work arrangement), and environment of work (setup of the home office). The determinants for mental health included social support, isolation and loneliness, burnout, and support systems from management. Lastly, the determinants for the adaptation of technology entailed acceptance of technology (usefulness, training, ease of use), infrastructure (digital tools, internet, and technical support), and diffusion of innovation (speed of adoption, compatibility, experimentation).

3.11. Methods of Data Analysis

The present study took a quantitative approach which requires a quantitative data analysis. Quantitative analysis entailed analyzing and interpreting numerical data to assist in the understanding of information through the identification of trends, patterns, and associations of variables via calculations. The researcher used MS Excel for calculation processes based on descriptive statistics which will help to summarize features of datasets such as median, mean, and standard deviations (Eteng, 2022). Moreover, the researcher embraced a cross-tabulation framework for making sense of data based on tables for the tabulation of data for ease of

understanding to draw parallels regarding aspects of remote work environment such as productivity, mental health of workers, and technological adoption before and after COVID-19 pandemic (QuestionPro, 2024).

3.12. Limitations of the Study

The researcher identified various limitations which included a relatively smaller sample size of 68 participants which did not provide adequate results to be generalized for the entire population. Secondly, the researcher realized incidences of response bias as the some respondents might have given only the desirable responses or influenced by the present experiences in remote work which might have skew the findings. Further, the study focused on self-reported data concepts which might have provided true reflection on aspects such as mental health.

3.13. Research Ethics

The researcher adhered to ethical considerations. First, the researcher obtained approval from the institution to get permission to engage in the study process. Secondly, the study used humans as subjects in the data collection. In such cases, the research followed the guidelines provided by the review board and IRB on humans as subjects (Bhandari, 2024). Besides, the researcher used consent forms to seek permission from the respondents to voluntarily engage in the research and only included them upon their signing of the forms as a show of their consent.

The researcher clarified to the participants about the study, its aim, and reasons for research to ensure clarity. Moreover, the researcher engaged participants in debriefing sessions to explain the details of the study, and the freedom of the participants to continue or decided to disengage in the study process when they felt insecure or any potential harm (Bhandari, 2024). The research further ensured the confidentiality of the respondents by enhancing their privacy,

securing the data, and embracing anonymity in data collection. The researcher guaranteed the anonymity of the respondents, and secured data at all times using a secured storage process in computers using strong passwords and being accessed for only academic purposes.

4.0.Chapter 4: Discussion of the Findings

4.1.Introduction

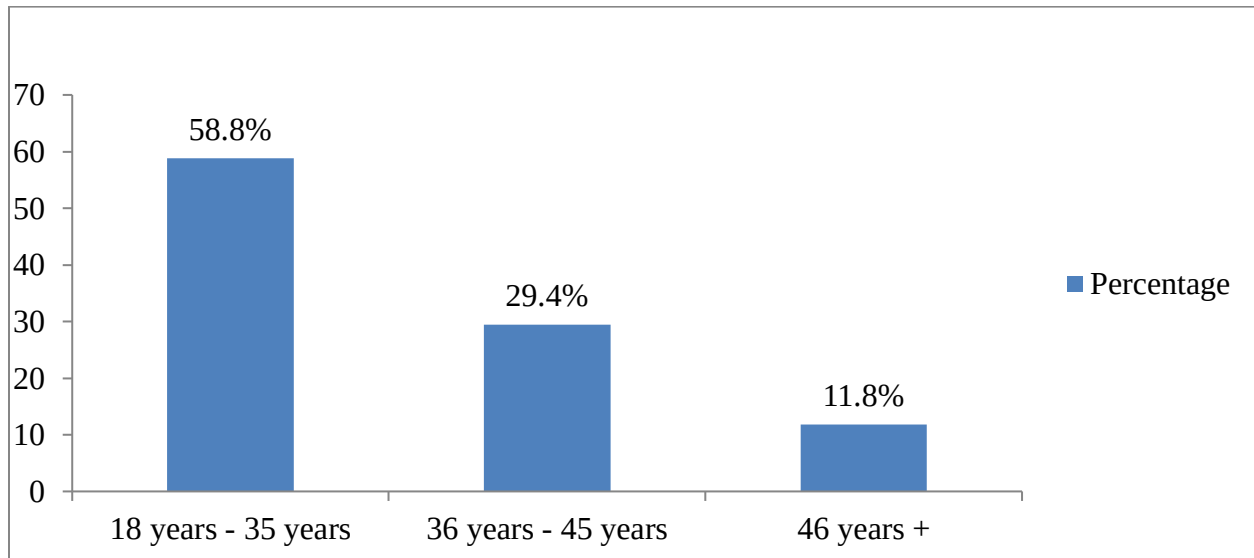
The section presented results and discussion commencing with an analysis of demographic data, followed by an analysis of variables such as productivity, mental health, technology adaptation, and a comparison of aspects regarding remote work environment before and after the COVID-19 pandemic era.

4.2.Demographic Results of Respondents

4.2.1. *Percentage distribution age of respondents*

The study included 68 samples of participants with different age categories. Accordingly, the majority of the participants accounting for 58.8 percent fell between 18 years and 35 years. This age group of the respondents included in the study showed that they are in their early professional careers and are adopters or adaptable to the remote work environment and technology. The second age category was 36 years to 45 years accounting for 29.4 percent. This group formed the middle-career people who balance their family responsibilities and their career progress. The rest of the respondents aged 46 years above accounted for 11.8 percent. The age group showed different aspects of preference for work and adaptability to remote work compared to the younger participants in the lower age categories. The age distribution of the respondents in the study showed that younger respondents join the workforce which reveals a trend in the remote work environment.

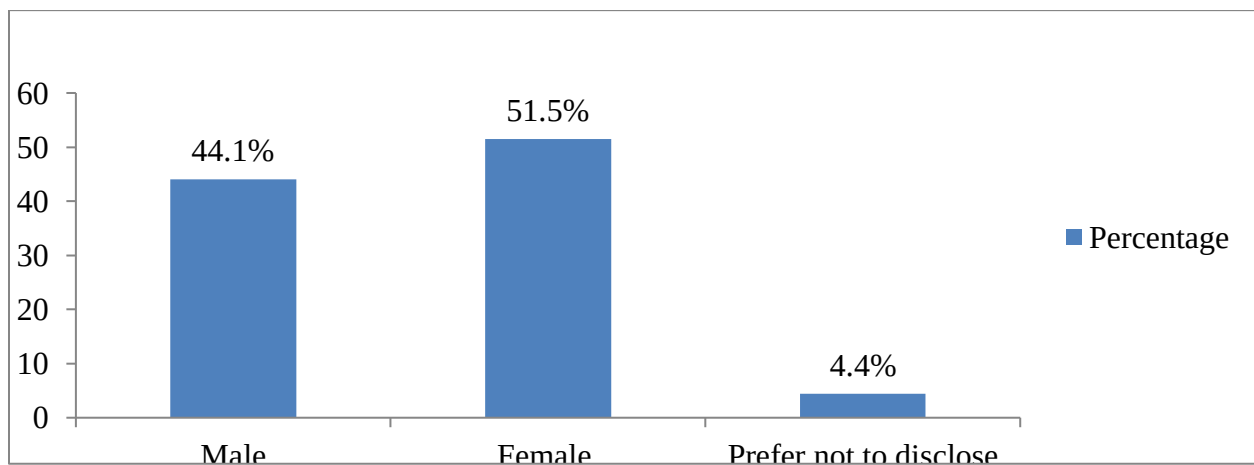
Figure: Percentage distribution of respondents



4.2.2. *Percentage of the gender distribution of respondents*

The present study also grouped the respondents in terms of their gender. The majority of the respondents accounting for 51.5 percent were female followed by 44.1 percent of men while only 4.4 percent refuted or preferred not to indicate their gender. The gender distribution results provided a unique perspective of the experience of the workforce in remote work settings, revealing that more females and males have challenges and experiences that offered unique information on remote work settings based on gender as indicated in the below figure.

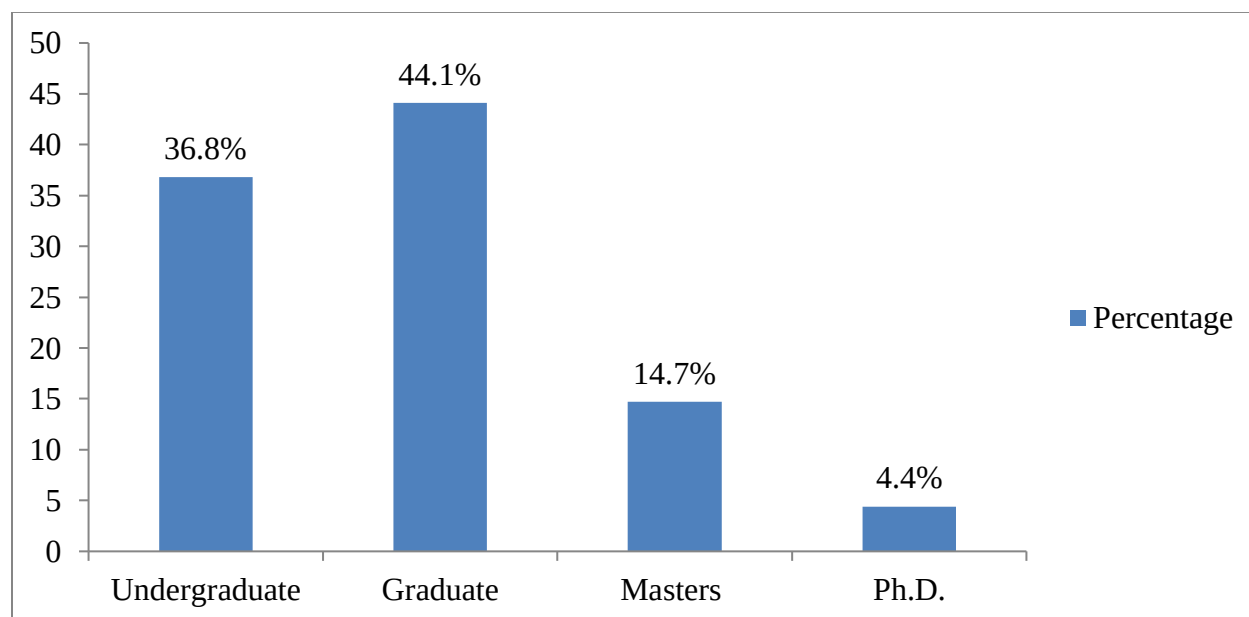
Figure: Gender distribution percentage



4.2.3. *Percentage level of education of the respondents*

The study explored the level of education of the participants with 44.1 percent of the respondents attaining graduate degree level, revealing a well-skilled and qualified pool of participants. This was followed by 36.8 percent of the participants with undergraduate degrees, representing a good number in the workforce with high qualification skills. Moreover, 14.7 percent of the respondents have master's degrees, mirroring participants with advanced specialization in their respective fields. Lastly, the restudy showed that only 4.4 percent of the participants had Ph.D. The distribution in the level of education indicated that the focus of the study on respondents with skills offered perspectives regarding remote work environments.

Figure: Percentage level of education

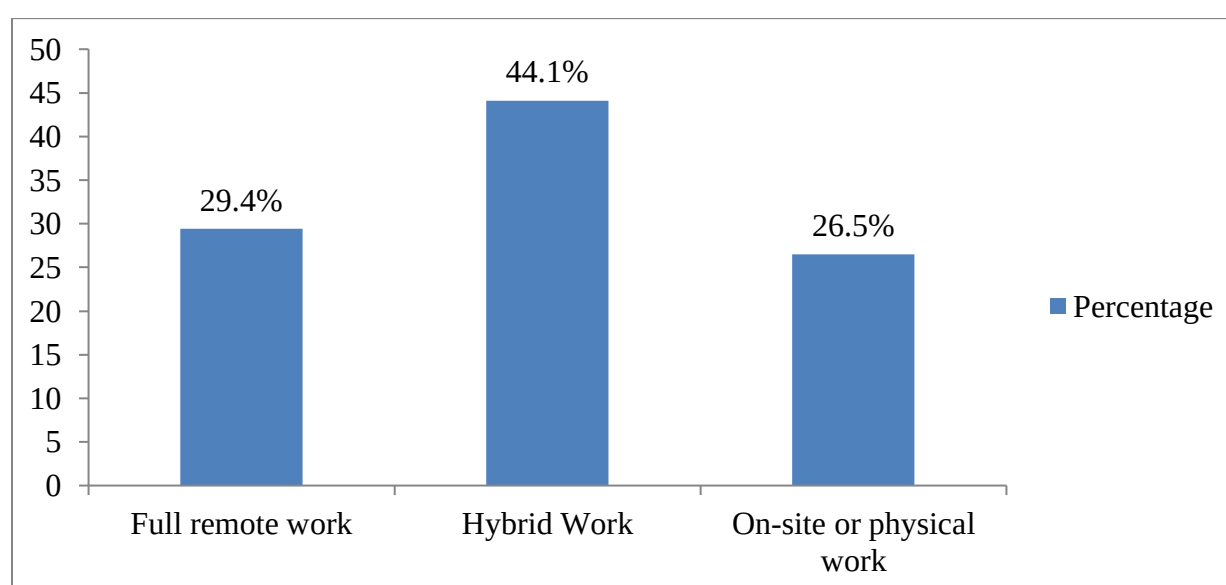


4.2.4. *Percentage work arrangement of the respondents*

The study noted the work arrangement of respondents with 44.1 percent of the respondents indicating that they follow a hybrid work setup followed by 29.4 percent of respondents fully engaging in remote work settings. Respondents who work on-site or physical

office work environment accounted for 26.5 percent. Accordingly, the hybrid work concept is most common among the participants which indicated a preference for a flexible work setting. Full remote work is also an important component of work, revealing a continuing trend of the remote work option. Further, the existence of onsite or physical office-based workers showed the continuous use of the traditional work setting and offered a comparative basis for the evaluation of the impact of hybrid and remote work concepts on the productivity and well-being of workers.

Figure: Percentage of work arrangement



4.3.Summary of Productivity in Pre-and Post-Covid-19

The present study explored productivity as an element of remote work setups before and after the coronavirus, showing changes. The results of productivity in pre-COVID-19 indicated 3.6 scores with 1.2 as the standard deviation, showing that workers feel productive in such remote work settings. This revealed a moderate agreement level among the workers regarding their level of productivity before the coronavirus. The study also indicated how respondents perceived the adequacy of equipment and technology which was slightly higher at 3.8 mean

score with SD 1.1. This suggested despite the workers considering adequacy in technology for improved productivity, there was variability in the experiences of workers.

The results on productivity in post-COVID-19 showed an increment in the perception regarding productivity. The respondents indicated 4.1 mean score and SD 1.0 on the rise in productivity among remote workers. The increment in the mean showed a positive change in how workers perceived their level of productivity when working in a remote environment after the coronavirus pandemic. Moreover, there was 4.3 mean score at SD 0.9 in the access of technological tools and equipment for productivity, revealing that workers currently feel that the technological equipment and resources are better suited and available to support productivity. The findings showed that a change to the remote work setting during coronavirus led to an improved perception of the productivity of workers. The increment in the mean scores for perceived productivity and the increased adequacy of technological equipment showed an improvement and adjustment in remote work settings. Further, a reduction in the standard deviation after the pandemic further showed more consistency in the experience of workers concerning the effectiveness of technology at the remote work settings.

Table: Productivity in remote work environment

	Pre-coronavirus		Post-coronavirus	
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>
Feel productive in the remote work environment	3.6	1.2		
Feel productivity has further increased in remote work			4.1	1
Technology and equipment good for productivity	3.8	1.1		
Accessing more Technological tools and equipment for productivity			4.3	0.9

The results on productivity of remote work environments in pre-and post-corona virus pandemic era shown above are linked with other studies. Bloom et al. (2020) indicated improvement in productivity among employees in remote work environments because of the reduced distractions in the office and increased flexibility in working hours. The authors affirmed this concept by revealing that about 10 percent of employees in the US shifted to work from home in 2020 irrespective of the notions of shirking from home. The study followed a random process of selecting respondents working from homes or physical offices for over 9 months. The data showed that working from home led to an increment in performance by 13 percent with 9 percent of remote workers from home working more minutes in each shift due to reduced sick days and breaks with 4 percent making more calls each minute because of the quiet environment (Bloom et al., 2020). The authors also revealed that the workers operating from homes have enhanced job satisfaction with fewer turnovers. Such advantages lead to improved productivity in the post-corona virus era.

Dahik et al. (2020) supported the idea of productivity through the usage of the latest technology and tools for remote workers to perform their daily activities and promote collaboration through improved communication with teams and colleagues as they access more technology equipment and tools at their disposal, leading to improved productivity.

4.4.Summary of mental health analysis statements

The study explored the mental health aspect of remote workers which revealed changes in terms of the levels of stress and the support that employers provide to the workers before and after the coronavirus pandemic. The findings in the pre-COVID-19 era indicated 3.4 mean score and SD 1.3 concerning anxiety and stress when working in a remote environment. The scores showed a moderate level of anxiety and stress linked to remote work environments with

variability in the experience of workers. Besides, the results indicated 3.2 mean score and SD 1.4 on adequacy of the support that employers provide on the mental health of employees. This showed that despite the available support of employers, the workers perceived it to be inconsistent and insufficient.

The report on the same in post-COVID-19 indicated increment in the reported levels of stress linked to remote work environment. The 3.8 mean score and SD 1.2 on the heightened stress of remote workers showed that despite the increase in the level of stress, the variation of the experience of workers is similar to the level in the pre-coronavirus era. This showed that the change to remote work, although important, worsened the anxiety and stress levels among workers. Nevertheless, the mean score for the mental health support that the employers provide showed significant improvement at 4.0 mean score and SD 1.1. This showed a positive change in the perception of workers regarding the support that employers provide, indicating that companies continue to increase their support and efforts in offering adequate mental health initiatives and support for employees in remote work environments in a post-corona pandemic era as summarized in the below table.

Table: Mental health analysis

Mental Health Analysis Statements	Pre-coronavirus		Post-coronavirus	
	<i>Mean</i>	<i>SD</i>	<i>mean</i>	<i>SD</i>
Stress and anxiety linked to working remotely	3.4	1.3	3.8	1.2
Heightened stress when working remotely				
Employers offered enough support for remote workers for mental health	3.2	1.4	4	1.1
Employers increased more mental support for remote workers				

The results above on the mental health of workers in remote work environments revealed the levels of stress and anxiety with such increment becoming concerned with studies indicating similar concerns. Singh et al. (2022) indicated that workers in remote environments experience heightened stress or technostress due to the excessive use of technology. The study sampled 306 workers indicating that personal and work digital platforms induced stress in remote work environments, translating to enhance strains and exhaustion while reducing their well-being. Similarly, Tam (2020) indicated that companies embrace mental health activities and initiatives during the coronavirus for the employees. This is due to the increased levels of stress cases among the remote workers due to isolation, and anxiousness. The report indicated that 87 percent of the workers in Hong Kong noted that they suffered from stress at work during the pandemic. Thus, Companies continue to provide support to workers through managers and supervisors who reach them easily. Hence, companies strive to ensure well-being and good mental health of workers in remote work setups.

4.5. Summary of technology analysis statement

The study explored the technological adaptation in remote work setting which indicated a significant transformation in the comfort and experience of workers before and after the coronavirus pandemic. The results showed that workers in the pre-COVID-19 pandemic indicated 3.5 mean score of 3.5 and SD 1.2 revealing their level of comfort with new technology in the remote work environment. This showed a moderate comfort level with some variability in the experience of workers. The level of comfort suggested that the technological adaptation brought some aspects of challenge among workers. Further, the results on the sufficiency of technological infrastructure as revealed by a mean score of 3.6 and standard deviation of 1.1 for workers reflected a moderate level of agreement that the technological setup at such remote

settings was good or adequate to ensure efficiency. This implied that despite the technological infrastructure being perceived as sufficient, there was a need for improvement.

Separately, the results showed an improvement in the adaptation of workers to the technology. This was affirmed by 4.2 mean score and SD 1.0 for adapting to the new technology within the remote work environment. Thus, it revealed a higher level of comfort and adaptation of workers to the technological tools over time. Moreover, 4.4 mean score and SD 0.9 on improvement of remote work environment on technological infrastructure showed improvement which contribute to efficiency of remote work environment in post-corona virus era.

Table: Technology analysis of remote work environment

Technological adaptation analysis statements	Pre-Covid-19		Post-Covid-19	
	<i>Mean</i>	<i>Standard Deviation</i>	<i>Mean</i>	<i>Standard Deviation</i>
I was comfortable with new technology in a remote work context	3.5	1.2	4.2	1
I adapted to the new technological infrastructure in the remote work settings				
Remote setting was sufficient due to technological infrastructure that ensured efficiency	3.6	1.1	4.4	0.9
Remote work setting improved much in terms of infrastructure and technology				

4.6.Summary of comparison elements before and after Covid-19

The study compared different elements regarding workers in the remote work setting in the pre-and post-coronavirus era. The results revealed a unique perspective concerning the aspects of the remote environment and the change responding to the disease, revealing significant changes based on feedback, workload, support, technology, and work conditions.

The results showed that in a remote environment workload before the coronavirus was at 30 percent but increased to 65 percent as perceived by respondents in the post-COVID-19 pandemic. The increment indicated that the change to work remotely led increase in workload for many workers. The change to the remote work setting could blur the boundaries between personal life and work, translating to long hours of working and intense demands of work. Secondly, the results showed that feedback that managers offered to workers in the pre-COVID-19 era was at 35 percent but increased to 58 percent in post-corona virus as indicated by the respondents. This result indicated that companies are becoming proactive in offering feedback to workers in the remote environment. The increment in the feedback concepts is a response to the challenges experienced in remote work environments, where communication becomes important in ensuring engagement and increased performance. The study further explored the level of expectations of workers which have increased from 28 percent before the pandemic to 57 percent after the coronavirus pandemic. The increment indicated that employers increased the expectation of performance among workers as a response to the remote work setups. The change to the remote work environment leads to improved focus on productivity and results, translating to increased pressure on workers.

The research also explored access to technology by workers as an aspect of remote work environments with an increment in access to technology at 44 percent in pre-pandemic increasing to 73 percent in post-COVID-19. The increment explained the heightened adoption of digital tools and the technologies required for remote work. The coronavirus pushed companies to invest more in technology to facilitate remote work concepts which leads to increased access to required resources.

Support from management is an area that also had increment from 36 percent in the pre-coronavirus era to 68 percent in the post-coronavirus era which showed that enterprises continue to acknowledge the necessity for more support systems for workers in remote environments. Thus, effective support from the management is important for remote workers as it addresses the issues and maintains the well-being of workers. Further, the study indicated that respondents noted that training of workers regarding remote work conditions was at 24 percent before the coronavirus but increased to 66 percent in the post-COVID-19 pandemic. This increment shed more focus on equipping workers with the necessary skills required to adapt to remote work environments and new technologies. Thus, it helps workers explore new equipment and workflow.

The study also explored the flexibility of work arrangement of remote work before and after coronavirus with respondents indicating that it increased at 29 percent before the pandemic and 77 percent increment in post-covid-19 pandemic. The change indicated an increment in the adoption of policies that promote flexible work arrangements due to the necessity to accommodate different work styles in remote environment and personal situations. The results further explored improvement in the work environment at 31 percent before the coronavirus and 74 percent after the pandemic. The change suggested that remote work led to improved work conditions for workers because of the reduction of time for commuting and the ability to establish a better workplace at home.

The study also explored increased loneliness and isolation of remote workers before and after the coronavirus with an increment of 17 percent before corona and 52 percent after the pandemic. The increment showed that isolation is a problem in remote work settings due to reduced interactions of workers with colleagues, leading to loneliness and isolation. The report

also indicated increased burnout of workers before the coronavirus at 13 percent and 56 percent after the coronavirus. This increment showed that a remote work environment led to an increment in burnout because of the extended working hours, high workload, and poor boundaries in balancing life and work.

The study noted an increment in support of the system from the management at 22 percent before the coronavirus pandemic and 73 percent after the pandemic. The results showed a wider acknowledgment of the necessity for more support systems from employers to assist workers in exploring challenges associated with working from home.

Separately, the study revealed that accepting the technology for remote work was 37 percent before corona virus which increased to 75 percent in the post-corona virus. The improvement indicated that more workers embrace digital technologies and tools due to the necessity to work remotely. The increased acceptance is important for improved production. Further, the results noted that the availability of digital tools, technical support, and the internet before the coronavirus was at 29 percent which increased to 74 percent after the pandemic. Thus, the increment mirrored more investment in infrastructure to support remote work environments and equip workers with a required resource to effectively perform their tasks. The report further explored the diffusion of innovation which respondents indicated to be at 26 percent before the coronavirus but increased to 61 percent after the pandemic. The increment showed wider and faster implementation of latest technologies and practices as a response to the remote work conditions.

Table: Comparison of elements before and after Covid-19

Comparison of elements before and after the coronavirus	Pre-coronavirus (Percentage)	Post-coronavirus (Percentage)
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Level of workload (increased)	30%	65%
Level of feedback offered to workers (increased)	35%	58%
Expectations (increased)	28%	57%
Accessing technology	44%	73%
Support from management	36%	68%
Training of workers	24%	66%
Flexibility in work arrangement	29%	77%
Improved work environment	31%	74%
Increased social isolation and loneliness	17%	52%
Increased burnout	13%	56%
The increased support system from management	22%	73%
Acceptance of technology (usefulness, training, ease of use)	37%	75%
Increased digital tools, internet, technical support	29%	74%
Diffusion of innovation (speed of adoption, experimentation, and compatibility)	26%	61%

Studies support the above comparative findings on the elements of a remote work environment. Dronova (2021) supported the results by indicating that the coronavirus pandemic led to poor separation of professional and personal lives when working remotely. The diminished work-life boundaries between home and work and the heightened workload led to more challenges amidst the high expectations of the employers. Adekoya et al. (2022) further supported the findings by indicating that the coronavirus increased the trend with remote workers experiencing workload because of no physical or traditional boundaries and high expectations. This expectation arises because of the improved flexibility, enhanced smart work practices, improved self-discipline of workers, and improved roles in leadership in remote work environments. Palumbo (2020) further confirmed that workload in the remote work environment was becoming a challenge to remote workers, especially the telecommuters due to poor balancing of work priorities and life. Workers at home continued to suffer due to conflicts between life and work priorities, resulting in fatigue.

Margariti et al. (2021) on the increasing engagement of workers in the remote work environment because of enhanced feedback that workers get from supervisors or managers as a result of virtual communication which increases their performance. Adekoya et al. (2022) further noted that remote work led to increased expectations which further enhanced burnout and stress among remote workers due to increased demands with limited support from employers. Smith et al. (2024) noted that the coronavirus spurred remote work environments and investment in technology to offer support for workers in such settings leading to more accessibility of the technology. More workers accessed digital tools and obtained support for better results. Vargo et al. (2021) affirmed more use of digital tools in remote work in post-COVID-19, indicating various technologies in remote work environments due to video conferencing, the use of AI, and tools to analyze data and communication.

Separately Choudhury et al. (2022) affirmed the increased flexible work arrangements in post-corona virus which allowed more workers to manage their professional and personal lives, translating to work satisfaction. Similarly, Costin et al. (2023) noted an increase of challenges such as isolation and loneliness because of reduced interactions and limited work-life boundaries, translating to burnout and isolation. Lastly, Studies (Kane et al., 2021; Rosa 2020; Castrillon, 202) indicated that companies embrace new technology to ensure effectiveness and efficiency in remote work environments, leading to productivity.

4.7.Exploration of Hypotheses

- i. Hypothesis one: There is no significant increase in productivity at the remote work setting after coronavirus compared to the time before coronavirus.***

The results from the study regarding productivity before and after the coronavirus indicated 3.6 mean score and SD 1.2 before the coronavirus and 4.1 mean score and SD 1.0 after

the coronavirus. The results revealed an increase in the scores regarding productivity in post-coronavirus era compared to pre-coronavirus. This showed an increment in mean scores from 3.6 to 4.1, showing agreement among the participants that there was an improvement in productivity in the post-corona virus. Therefore, the data rejected the null hypothesis that indicated no significant increase in productivity in remote work environments. Hence, it accepted the alternative hypothesis (H1: there is a significant increment in remote work productivity after coronavirus compared to period before the pandemic).

ii. *There is a reduction in stress among remote workers in post-coronavirus time compared to the time the pandemic because of clear boundary between work priorities and life and no isolation.*

The study results on reducing stress among the remoter workers showed 3.4 mean score and SD 1.3 among workers before coronavirus and 3.8 mean score with SD 1.2 after coronavirus. The results showed an increment of the mean score from 3.4 to 3.8, indicating that the workers experienced increased stress in the post-coronavirus era. This increment rejected the null hypothesis that stress reduced and is likely to reduce because of clear separation between work priorities and priorities concerning life and reduced isolation. Thus, the data rejected the null hypothesis.

iii. *Hypothesis on technological infrastructure*

The researcher hypothesized that no significant adaptation of technological infrastructure exist for the remote work in the post-coronavirus era compare to pre-coronavirus era. The study recorded 3.5 mean score with SD of 1.2 on comfort with technology before the coronavirus and 4.2 as a mean score with SD 1.0 on comfort with the technology in the post-COVID-19 era. The mean score from the comfort that workers get with technology significantly

increased from 3.5 to 4.2, showing an adaptation to the technological infrastructure in the post-corona virus era. Thus, the results showed a significant adaptation of the technological infrastructure which rejected the null hypothesis.

Chapter 5: Conclusion

The present study explored how workers in the remote work setting perceive such working environments in the times before and after the coronavirus. The study employed quantitative data collection based on online survey targeting 68 samples. The results indicated significant changes in productivity mean scores from 3.6 before the coronavirus to 4.1 in the post-corona virus era. This showed that the remote work environment continues to be efficient, especially when supported with resources and the latest technological tools. Despite the merit of remote work concepts in companies, workers also showed increased levels of stress and anxiety while companies continued to provide mental health support for the workers. The study further indicated an increment in the technological adaptation with workers gaining more comfort and adequacy of infrastructure in the post-coronavirus time in comparison with the era before coronavirus, revealing a positive impact of increased digital tools to ensure efficiency in remote work. The results of the comparative analysis explained the increment of workload, social isolation, and burnout as concerns in remote work environments in the post-corona virus period.

The study exhibited limitations that included using a relatively small sample size of 68 respondents. This provided data that is not generalizable in the larger population. Secondly, the use of a self-administered online questionnaire might have resulted in response bias while the use of quantitative questions limited respondents from giving their opinions and perceptions.

The researcher recommended future longitudinal studies to provide more information on the sustained effects or impacts of productivity, technological adaptation, and mental health to

help in exploring the evolution of the elements based in long-term. Secondly, more studies should explore participants from diverse backgrounds in different sectors, and job roles to ensure that the findings are representative regarding different remote work settings. Further, future studies should embrace both interviews and surveys to offer rich information on successes and challenges that remote workers experience in their respective environments based on their mental health and perception of technology adaptation

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Appendix 1: Questionnaire

Questionnaire

Section A: Demographic Questions

a. Age of Respondent (kindly tick where your age falls)

Age category	Tick
18 years – 35 years	
36 years – 45 years	
46years+	

b. Gender

Gender type	Tick
Male	
Female	
I prefer not to disclose	

c. Level of Education

Education level	Tick
Undergraduate	
Graduate	
Masters	
Ph.D.	

d. Work arrangement

Work arrangement	Tick
Full work in the remote work environment	
Hybrid	
Full work on-site	

Section B: Questions based on variables

1. Productivity

Kindly mark the level of your agreement on the statements.

- a. I felt productive when engaging in a remote work environment before COVID-19

	Tick
I strongly disagree (1)	
I Disagree (2)	
Neutral (3)	
I Agree (4)	
I strongly agree (5)	

- b. I feel that my productivity has further increased when engaging in a remote work environment after COVID-19

	Tick
I strongly disagree (1)	

I Disagree (2)	
Neutral (3)	
I Agree (4)	
I strongly agree (5)	

- c. The technological tools and equipment are good and adequate to promote productivity before COVID-19 emerged.

	Tick
I strongly disagree (1)	
I Disagree (2)	
Neutral (3)	
I Agree (4)	
I strongly agree (5)	

- d. I currently access more equipment and tools to ensure productivity when working in a remote environment after COVID-19

	Tick
I strongly disagree (1)	
I Disagree (2)	
Neutral (3)	
I Agree (4)	

I strongly agree (5)	
----------------------	--

2. Mental health

Please place a tick where appropriate.

- a. I experienced stress and anxiety linked to working remotely

	Tick
I strongly disagree (1)	
I Disagree (2)	
Neutral (3)	
I Agree (4)	
I strongly agree (5)	

- b. I experience increased stress when working remotely after the COVID-19 pandemic.

	Tick
I strongly disagree (1)	
I Disagree (2)	
Neutral (3)	
I Agree (4)	
I strongly agree (5)	

- c. The employer offered enough support on mental health for remote employees before the COVID-19 pandemic.

	Tick
--	-------------

I strongly disagree (1)	
I Disagree (2)	
Neutral (3)	
I Agree (4)	
I strongly agree (5)	

- d. The employer increased more mental support for remote workers in the post-COVID-19 pandemic

	Tick
I strongly disagree (1)	
I Disagree (2)	
Neutral (3)	
I Agree (4)	
I strongly agree (5)	

3. Technological Adaptation

Please tick the box to show your level of agreement with the below sentiments.

- a. I was comfortable with the new technologies in remote work context before the COVID-19 pandemic.

	Tick
I strongly disagree (1)	
I Disagree (2)	

Neutral (3)	
I Agree (4)	
I strongly agree (5)	

- b. I adapted to the new technological infrastructure in remote work settings after the COVID-19 pandemic.

	Tick
I strongly disagree (1)	
I Disagree (2)	
Neutral (3)	
I Agree (4)	
I strongly agree (5)	

- c. Remote setting was sufficient due to the technological infrastructure that ensured efficiency before the pandemic.

	Tick
I strongly disagree (1)	
I Disagree (2)	
Neutral (3)	
I Agree (4)	
I strongly agree (5)	

- d. Remote work settings improved much in terms of infrastructure and technology after the COVID-19 pandemic.

	Tick
I strongly disagree (1)	
I Disagree (2)	
Neutral (3)	
I Agree (4)	
I strongly agree (5)	

4. Comparison of elements before and after COVID-19 pandemic in remote work

	Pre-COVID-19 (indicate 1)	Post-COVID-19 (indicate 2)
Level of workload (increased)		
Level of feedback offered to workers (increased)		
Expectations (increased)		
Accessing technology		
Support from management		
Training of workers		
Flexibility in work arrangement		
Improved work environment		
Increased social isolation and loneliness		
Increased burnout		
The increased support system from management		

Acceptance of technology (usefulness, training, ease of use)		
Increased digital tools, internet, technical support		
Diffusion of innovation (speed of adoption, experimentation, and compatibility)		