

Process improvement strategy (PIS) and employee productivity amid COVID-19 pandemic among bank employees

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Abstract

Purpose – This study aims to examine process improvement strategy (PIS) (proxied by remote work, workforce training, and technological innovation), and employee productivity amid the COVID-19 pandemic among bank employees.

Design/methodology/approach – The study employed cross-sectional and descriptive design by applying multistage sampling techniques using convenience sampling to select the study organization and stratified and simple random sampling to select 900 respondents for the study. Data were collected by using validated measures of the study variables designed into a questionnaire. Pearson's correlation and simple regression analysis were employed to establish relationships and causal effects among variables respectively.

Findings – Results showed significant relationships between the PIS (work-from-home, workplace training, and technological innovation) and the outcome variable (employee productivity); and predictive capabilities between the PIS and the outcome variables (employee productivity). The study revealed that remote work accounted for the highest variability ($R^2 = 0.775$) in employee productivity, followed by workplace training ($R^2 = 0.499$), and finally investment in technological innovation ($R^2 = 0.486$) and as such PIS fosters employee productivity and may, therefore, be applied when faced with a similar pandemic in the future.

Originality/value – The study was recognized for its significance in examining how PIS supports enhancing employee productivity in banks and, by extension, other organizations during a pandemic. The research has proven to be crucial in providing insights into bank management in emerging economies and other organizations worldwide that have previously gone unnoticed during a pandemic. It has aided in the extension of existing literature on PIS and employee productivity by carefully developing a framework, thus covering practical knowledge gaps.

Keywords Employee productivity, Process improvement, Remote work, Technological innovation, Workforce training

Paper type Research paper

1. Introduction

The unique Coronavirus outbreak, also known as COVID-19, began in Wuhan, China in December 2019 and had since spread to practically every location in the world. This stride to prevent the spread of the disease by the different governments by imposing a stay-at-home order had negatively affected the operation of businesses including banks in every part of the globe (Sohrabi *et al.*, 2021; Wilder-Smith and Freedman, 2020). However, the forced stay-at-home caused by the new virus adversely affected bank employees' productivity (Ozili, 2020), and as a result, bank executives recognized how urgent it was to put processes in place to keep their businesses afloat so as to foster employee productivity.

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According to [Climent et al. \(2009\)](#), bank processes involve different kinds of services at different levels. For example, entry-level and operational employees serve customers, manage paperwork, advertise bank products, and respond to customers' questions. Senior management level receives reports from middle management, which oversees teams, directs projects, and keeps an eye on performance. Senior management is in charge of departments, supervises daily operations, assesses employee performance, and makes operational choices. Setting long-term objectives, maintaining relationships, supervising finances, and preserving the stability and reputation of the bank are among the duties associated with the executive level. The collaboration and integration of these various management levels is paramount for the bank to achieve its broad objective and strategic goals, maintain regulatory compliance, provide customers with high-quality services, and ensure efficient and effective operations while enhancing employee productivity.

Employee productivity, is an index that compares the value of an employee's outputs to their inputs ([Igudia, 2021](#)). As a result, improving employee productivity heavily relies on organizations' strategies ([Darvishmotevali et al., 2020](#)). Consequently, managers invented various tactics to improve their employees' productivity and provided the highest quality services to their clients ([Darvishmotevali et al., 2020](#)). Paramount among these tactics is the stability plan which implies ensuring the stability and resilience of the banking system ([Davenport, 1993](#)) by ensuring a departure from the status quo and ensuring a process in place to improve banking operations among bank staff. In line with this, a process is defined as "a structured measured set of actions designed to create a specified outcome for a certain consumer or market" ([Davenport, 1993](#)). Logically, it follows that "process improvement" relates to a radical rearrangement of a productive process, with a "radical" increase in production.

This radical redesign, applied by bank management to adjust to the new normal created by the COVID-19 pandemic and provide customers with a safe and seamless banking experience, reflects the evolving challenges faced by the banking sector during this era. The banking sector has been significant to the GDP, employment, trade, and capital imports of nations such as Nigeria ([Ajakaiye et al., 2016](#)). Nevertheless, as [Nguyen and Mogaji \(2022\)](#) point out, the COVID-19 epidemic altered operational procedures, impacting worker productivity and lowering the industry's survival margin. [Rakshit and Paul \(2020\)](#) also noted that bank employees find it more difficult to maintain productivity in the industry due to the requirement of tight adherence to social distancing measures.

Notwithstanding these difficulties, bank executives continue to plan for the long-term viability of their company and cannot afford to rest on their laurels. Observations, however, indicate a decline in work enthusiasm among bank employees due to the profound impact of the novel disease ([Ehigiator, 2017](#)). Consequently, slow pace of work, laxity, boredom, absenteeism, anxiousness, presenteeism, etc. is not uncommon for those who by chance physically find their way to their offices amidst the pandemic ([Tahir, 2021](#)).

As a result, one of the strategic ways to mitigate employees' low productivity during the COVID-19 pandemic is to look into the status quo process framework (going to work in physical offices) and improve on it ([Usman et al., 2021](#)). Given the different Covid-19 variants and fluctuating infection rates, it is crucial to continuously adapt, even with vaccination efforts and different reopening phases. To tackle this challenge, bank management has implemented a strategy where employees alternate between remote and in-person work, as discussed by [Kulkarni et al. \(2022\)](#). While remote work gained traction during the pandemic and remains prevalent in many financial institutions today, shifting client needs and operational demands are prompting the Nigerian banking sector to embrace hybrid models that blend both in-office and remote work arrangements.

Similarly, including employees in the overall process improvement strategies by involving them in training should not be a misplaced priority. As the new normal comes to stay, the

skills, knowledge, and abilities required to handle the new normal need to be inculcated into the employees for the smooth running of the bank processes. Banks regularly assess and improve their operational procedures through training of their workforce and become more adaptable, durable, and competitive in a changing market (Al-Rawahi, 2022). Efficient training of employees is essential for steering banks through times of transition and uncertainty (Chigbu and Nekhwevha, 2021). This suggests that given a rapidly changing environment, resilience, creativity, and employee engagement can be fostered through workforce training, inclusive management practices, agile decision-making, and adaptive leadership. (Al-Rawahi, 2022).

In addition, the productivity and well-being of employees continue to be top priorities for bank management. Therefore, investment in state-of-the-art technology serves as a good source of networking among employees in the banking sector during this period because it will help in the easy transformation of the processes when the employees are faced with a new situation (Marcu, 2021). Banks continue to invest in technology in an effort to improve customer satisfaction, security, and efficiency. In order to improve service delivery and streamline procedures and enhance employee productivity, emerging technologies like blockchain, artificial intelligence, and digital banking solutions are being incorporated into banking operations more and more vis-à-vis what was practiced before the Covid-19 pandemic (Sharma, 2022).

As a result, the researcher was poised to ask the following questions: (1) To what extent did remote work influence employee productivity amid the COVID-19 pandemic among bank employees? (2) What influence did workforce training have on employee productivity amid the COVID-19 pandemic among bank employees? (3) To what extent did technological innovation enhance employee productivity amid the COVID-19 pandemic among bank employees? The extent to which the researcher would give solutions to these questions is what informed this study among bank employees in Lagos Metropolis, Nigeria.

The choice of Nigeria is that it is an emerging economy as well as the most populous black nation in the World (Soludo, 2006). The justification for using Nigerian banks is their massive contributions to the country's GDP and economic growth. For instance, between 2017 and 2020, the Nigerian banking sector gradually added over N168.4 trillion to the GDP of the nation, demonstrating remarkable growth (Business Day, 2022, March 4). The choice of Lagos State was that it doubles as the former capital of Nigeria and it is the present commercial hub of the country.

The study will therefore be of paramount importance because it will give policymakers and banks' management and management of other organizations around the world insights into process improvement strategies that had previously gone unreported which will be made possible thanks to this research. Likewise, employee productivity as a subset of organizational productivity is one of the indices of Gross Domestic Product (GDP). Therefore, this study will be of significance to employees, organizations, and society as a whole as the suggestions therein can help in improving the socio-economic development of a country and in the process achieve one of the Sustainable Development Goals (SDGs) of achieving economic growth.

2. Review of literature

2.1 Theoretical framework

There are two theories explaining this study. They are:

1. Business Process Reengineering
2. Contingency Theory of Management

2.1.1 Business Process Reengineering (BPR). Business process reengineering was introduced by [Hammer et al. \(1993\)](#) and is based on a radical improvement strategy. This method suggests that while it is beneficial to increase the performance of sub-processes, it cannot provide significant benefits if the process itself is fundamentally inefficient and outmoded. This implies that bank procedures should not remain stagnant, they should rather be constantly improved upon to be able to mitigate the challenges brought about by the new normal. Despite the challenges posed by the COVID-19 pandemic, organizations, including the bank, have leveraged it as an opportunity to implement BPR.

This involves adopting practices such as automation, remote work, collaboration, enhancing operational efficiency, improving customer experience, utilizing data analytics, and enabling agile decision-making through the integration of business intelligence tools ([Gunasekaran et al., 2018](#)). For example, through project management software, instant messaging tools, and video conferencing platforms, bank encourages efficient communication and collaboration among remote personnel ([Ilag, 2021](#)). Likewise, bank uses state-of-the-art tools like machine learning algorithms and artificial intelligence to improve fraud detection and risk management procedures ([Bhatore et al., 2020](#)). To give clients easy access to their accounts that is safe and secure, it also makes investments in digital payment systems and mobile banking applications.

As a result, the banks are re-engineering the entire process in order to gain the greatest possible benefits for both the company and its employees with the goal of achieving the highest work quality while increasing employee productivity ([Randhawa and Ahuja, 2017](#)). However, the situational considerations and the requirement for contingency planning, which are essential during the pandemic are not expressly mentioned in the BPR ([Aman and Miftah, 2021](#)). Therefore, to choose the best techniques for optimizing processes and to assure employee productivity, banks must take into cognizance the particular difficulties and contextual aspects of the pandemic situation. Consequently, the contingency theory is discussed in the next section.

2.1.2 Contingency Theory of Management. The proponents of the theory like [Lawrence and Lorsch \(1967\)](#) asserted that the environment which is comprised of both internal and external factors is paramount in determining an organization's action plans and that a single organization strategy will simply not yield optimal outcomes. In other words, that is, there is no "one-size-fits-all" approach to organizing a company's strategy ([Ginsberg and Venkatraman, 1985](#)). Despite this, [Hofer \(1990\)](#) and [Schoonhoven \(1981\)](#) emphasized that a typical paradigm in the contingency research tradition would focus on the contingent interaction between the contextual factors and organizational outcomes in a specific situation ([Ametepe and Onokala, 2023](#); [Ginsberg and Venkatraman, 1985](#)). The impacts of the COVID-19 pandemic on the productivity of employees cannot be overemphasized. The theory recognizes that changes in the conditions (i.e. outbreak of COVID-19) lead to improvements in bank processes to boost staff productivity ([Kim et al., 2015](#)).

The contingency theory holds that for management procedures to be effective, they must be customized to the unique challenges that an organization is dealing with. Assessment of the current situation, risk reduction, identification of contingent factors, flexibility and agility, employee involvement, monitoring and evaluation, learning and knowledge sharing, and specially designed process improvement plans, can all help with this. For instance, banks provide its staff with the abilities and information required to prosper in a quickly changing environment, by investing in virtual training sessions, online learning platforms, and workshops that address subjects like customer relationship management, cybersecurity best practices, digital banking trends, and efficient remote collaboration strategies ([Aithal, 2023](#)). In addition, [Jaiswal et al. \(2022\)](#) bank provides tools and services, such as virtual wellness programs, flexible scheduling alternatives, and ergonomic home office sets, to assist staff members in maintaining work-life balance and mental health while blending in-office and working remotely.

2.2 The conceptual framework

2.2.1 Employee productivity amid Covid-19 pandemic. Productivity is referred to as the number of products and services produced per unit of labor, capital, or both. It is defined as the ratio of output to labor and capital. Productivity is defined as “the output per unit of input used” (Katz and Kahn, 1978). That is, productivity is the ratio of the total Output to the total Input. Hundreds of millions of people are working either physically on-site or remotely at home because of the Covid-19 pandemic. This places businesses and employees in difficult situations because there are severe interruptions at work and at home (PricewaterhouseCoopers, 2020). Before the pandemic, few companies had attempted to switch to remote working on such a large scale. Organizations and people have never seen change on this scale or at such a rapid pace (PricewaterhouseCoopers, 2020).

Companies could use tools to evaluate employee demands and manage workloads in order to increase productivity (Pamidimukkala and Kermanshachi, 2021). For this period, it is necessary for employees to undergo upskilling because it remains the emphasis and driving force for productivity (Igudia, 2021). Therefore, the firm’s competitive advantage and long-term profitability are based on higher staff productivity. Similarly, as Mukundi and Waweru (2016) argued, the value of a firm is determined by the people who operate it. While productivity may look difficult to assess, Bernardin (2007) points out that it can be expressed in terms of worker effectiveness and efficiency. As a result, the study investigates the process improvement strategies applied by the banks to manage the challenges of low employee productivity posed by the pandemic and this is discussed in the succeeding section.

2.2.2 Process improvement strategy. Burnes (2004), like many other experts, asserted in his article that process improvement is becoming increasingly important and it necessitates the development of relevant managerial skills and strategies. The harsh realities of COVID-19 have placed banks in a situation where they must be able to successfully manage the process in order to survive, succeed, and remain competitive, flexible, and extremely dynamic. It is worth noting that the banking industry has recently pulled more strings in many economies, proving to be different countries’ economic development hubs in the last four decades (Ehigiator, 2017). In the previous 20 years, it has been demonstrated that service organizations have made significant contributions to a lot of countries’ GDPs, employment, commerce, and capital imports (Ajakaiye et al., 2016).

For instance, Ehigiator (2017) opined that the banking industry is already playing a significant part in Nigeria’s growth process, with a 60% contribution to GDP and a 33% employment share on average. Likewise, Korzeb and Niedziółka (2020) stated that due to their support of financial transactions for both domestic and foreign transactions, banks play a significant role in the economy and help it flourish. As a result, the bank remains a critical tool for attaining economic growth and development, particularly during this epidemic, when the majority of businesses are suffering (Ozili, 2020). Employee productivity must be harnessed through techniques for enhancing the status quo in order to accomplish this. This study focused on three primary tactics that are relevant to the banking industry in the face of the Covid 19 epidemic, and they are as follows:

- (1) Remote work
- (2) Training and development
- (3) Technological innovation which are discussed in the next section. The justification for these three parameters was that together, these three factors cover important facets of updating banking processes, developing staff competencies, and utilizing technology to boost employee productivity and adaptability in challenging circumstances. These areas are pertinent and significant targets for process improvement strategies because they are in line with industry trends and the unique difficulties presented by the epidemic

2.2.2.1 Remote work and employee productivity amid Covid-19 pandemic. The term “remote work” is used in the context of this current research to define employees who utilize technology to operate remotely from the main group office at any time or location, as retrieved from interviews with experienced remote workers conducted in a study by [Grant et al. \(2019\)](#). Examples of works undertaken remotely were customer service and supports through digital channels such as emails, chats and phones; processing transactions remotely including bill payments and transfers, marketing and customer outreach through engagement with customer via email marketing, social media, and targeted digital communication. This involves reduced commuting, which contributes to a better balance of work and non-working lifestyles ([Grant et al., 2019](#); [Fonner and Roloff, 2010](#)). amid the COVID-19 outbreak, [Dingel and Neiman \(2020\)](#) projected that 37% of occupations in the United States could be done from home, including firm management, financial work, and scientific and professional services.

Moreover, experts remain divided into its advantages and disadvantages. For instance, reduced commuting time, reduced office politics, improved gender diversity, and the use of less energy and office space are just a few of the benefits; including healthy workplaces with lower absenteeism and turnover, as well as improved talent retention, productivity, and job satisfaction are just a few more ([Jonathan, 2019](#)). Other studies, however, link remote work to poor well-being, workplace pressure, loneliness, diminished collaboration, and communication overload; all of which can lead to overworking, which can negatively impact job effectiveness and performance ([Taser et al., 2022](#)).

In addition, the blurred barrier between work and family, distractions, payment for electricity and internet, social isolation, and employees incurring the costs associated with remote work are its other disadvantages ([Taser et al., 2022](#)). Workers’ isolation from coworkers, as well as supervisors’ concerns about productivity losses when working from home, are further problems ([Collins, 2009](#)). Furthermore, the interpersonal relationship between coworkers may be jeopardized ([Gajendran and Harrison, 2007](#)). That notwithstanding, the world has had to adapt to this new way of working, with certain workplaces becoming obsolete except for life-saving services. The COVID-19 pandemic not only took us out of the collaborative workplace but also emphasized the importance of contingencies and environmental protection. Therefore, the study hypothesized that:

H01. There is no significant positive relationship between remote work of staff and employee productivity amid the COVID-19 pandemic among bank employees.

H101. There is a significant positive relationship between remote work of staff and employee productivity amid the COVID-19 pandemic among bank employees.

2.2.2.2 Workforce training and employee productivity amid COVID-19 pandemic. Employee training and development are two sides of the same coin. It entails providing employees with training, workshops, coaching, mentoring, or other learning opportunities in order to inspire, challenge, and motivate them to perform their job functions to the best of their abilities while adhering to local, state, federal, and licensing organizations guidelines ([Igdia, 2021](#)). In their submission, [Drysedale et al. \(2008\)](#) averred that training is “learning events, instruction or programs that assist individuals to attain the levels of knowledge, ability, and competence needed to conduct their work effectively in order to meet corporate goals”. Employees were specifically trained to improve their knowledge, abilities, and professional development remotely by taking part in webinars, online courses, and virtual training sessions to stay updated on industrial trends.

Organizations must recognize that this new circumstance necessitates reevaluating old working practices and acquiring new skills in order to effectively manage the situation, protect employee wellbeing, and maintain targeted performance criteria. Keeping employees motivated, fostering good team collaboration, assisting them in navigating various working

modalities while at home, assisting employees from disconnecting from work, and having reasonable working time arrangements are just a few of the critical issues that remote worker and their managers can address through training and development programs (Nwaeke and Obiekwe, 2017).

Organizations have taken a variety of approaches to ensure that their employees are well-equipped to perform effectively when working from home; line managers are capable of managing remote employees effectively using a results-based approach; and all remote workers have the skills and knowledge required to successfully navigate regular remote work, including during the pandemic, or are offered relevant training to bridge any skills gaps (Saks, 2021). Firms that engage heavily in a capacity-building strategy of training and development in this pandemic are more likely to reap the benefits of a more enriched working environment, higher employee retention, improved employee productivity, and, by extension, corporate performance (Zaman *et al.*, 2020). In other words, when the goals of training and development are met, employee productivity rises, and the organization's effectiveness rises as well. Thus, it was hypothesized that:

H02. Workforce training does not favorably impact employee productivity amid the COVID-19 pandemic among bank employees.

H102. Workforce training favorably impacts employee productivity amid the COVID-19 pandemic among bank employees.

2.2.2.3 Technological innovation and employee productivity amid Covid-19 pandemic. Technology has become a very valuable asset for every organization in today's business world. Identifying and adopting the right technology may help a company's overall efficiency and market performance, as well as employee productivity, communication, collaboration, morale, and engagement (Igudia, 2021; Coppersmith, 2019). Significant technological innovation during the Covid 19 era were digital banking enhancement including mobile Apps and online banking portals, contactless payments like mobile wallet and QR Code payments, remote account opening and digital onboardings, etc. Technology can aid in the support and development of new work practices and research in the banking business. The evolution of technological and other breakthroughs has boosted the economics of information technology and substantially enlarged its applications (Bird and Lehrman, 1993).

Many authors and researchers in the field of organizational behavior agree that technological innovation has a major impact on the productivity of employees (Aboal and Garda, 2016; Angioha *et al.*, 2020). For instance, it is evidence of how enhanced technology has impacted commercial bank operations among employees in terms of effectiveness, efficiency, competitiveness, client base, and globalization of the sector, adding credence to the importance of improved technology in today's new normal corporate business climate (Angioha *et al.*, 2020; Ibikunle and James, 2012). According to Abubakar-Aliyu and Tasmin (2012), it increased the speed with which service firms can deliver prompt services or products to consumers while ensuring that quality is identified as the primary driver of technology investments.

Meanwhile, a plethora of these research produced inconsistent results, claiming a weak or non-existent link between enhanced bank technological innovation and employee productivity (Brynjolfsson and Hitt, 2003; Davenport, 1993). However, the majority of studies that show positive and substantial results on the investment and deployment of information technology to employee productivity are positive and significant, and the benefits to corporate success are numerous (Aboal and Garda, 2016; Angioha *et al.*, 2020; Masso and Vahter, 2008). It has been proven beyond reasonable doubt that technological innovations have a number of positive outcomes and benefits on employee productivity, such

as facilitating contacts and collaborations, as well as supporting workplace learning and performance. Therefore, it is hypothesized that:

H03. Technology innovation does not positively impact employee productivity amid COVID-19 pandemic among bank employees.

H103. Technology innovation positively impacts employee productivity amid COVID-19 pandemic among bank employees.

Furthermore, there is no agreement among academics on the numerous research that has been conducted on the relationship between process improvement and employee productivity. Process improvement (used as a unidimensional construct) has a positive association with organizational performance, according to a study by [Nwilu and Wainaina \(2021\)](#) conducted in Consolbase Limited in Kenya, where a questionnaire for 130 respondents and regression analysis were used. Similarly, a study by [Khan et al. \(2018\)](#) found a positive correlation between continuous improvement (measured by innovation) and organizational performance using data from 40 companies drawn from four sectors in Pakistan and an in-depth interview sample.

Another study by [Nganga and Nyaga \(2022\)](#) on Nairobi Bottler's Limited in Kenya using a questionnaire to collect a sample of 190 samples found a direct correlation between continuous improvement practices (proxied by evidence-based decision-making, customer focus, process approach, and employee engagement) and organizational performance. Likewise, [Sharma's \(2022\)](#) study uses 200 samples from the city of Bhopal to examine how innovative technology affects customer satisfaction in comparison to banks in the public and private sectors. The study employed the *Z*-test with a significance level of 0.05. It was discovered that banks in the private sector had an advantage when it came to innovation success. [Chege et al. \(2020\)](#) examines the association between technology innovation and firm performance in Kenya using 240 enterprises and structural equation modeling were used in the analysis. The findings indicate that technology innovation influences firm performance positively.

Research by [Mardikaningsih and Putra \(2021\)](#) investigate the effects of job training and job satisfaction on worker productivity at a Sidoarjo shoe firm. The study employed multiple linear regression analysis using a sample of sixty employees. According to this study, worker productivity is significantly impacted by job satisfaction. Furthermore, the impact of work training on employee productivity is noteworthy and beyond that of job satisfaction. In the midst of the COVID-19 pandemic, [Wiradendi Wolor et al. \(2020\)](#) examined the effects of e-leadership, e-training, work-life balance, and work motivation on the performance of 200 employees belonging to the millennial age at a Honda motorcycle dealership in Jakarta, Indonesia. The analysis of the data was done by structural equation modeling. The study demonstrates the beneficial effects of work-life balance, e-leadership, and e-training on employee motivation. Second, work-life balance, motivation at work, e-leadership, and e-training all improve employee performance.

Likewise, a study using 209 employees, [Galanti et al. \(2021\)](#) examines the effects of social isolation, job autonomy, self-leadership, and family-work conflict on workers' productivity, work engagement, and stress levels during the pandemic when they work from home (WFH). The data are analyzed using hierarchical linear regression. The study discovered that social isolation and family-work conflict among employees were negatively correlated with work-from-home productivity and engagement, but self-leadership and autonomy were positively correlated. WFH stress was adversely correlated with social isolation and family-work conflict, but it was unaffected by autonomy and self-leadership. However, a study by [Farooq and Sultana \(2022\)](#) utilizing structural equation modeling, a sample of 250 employees, and the National Capital Region and Punjab State, India, discovered a negative association between working from home and employee productivity during the pandemic.

The above submissions showed that quite a lot of studies have been done to establish a relationship between process improvement and employee productivity with no consensus among scholars. None of the studies has been carried out in Nigeria on the one hand and none of the studies has used a combination of remote work, training and development, and technological innovation as proxies for process improvement strategies as depicted in the conceptual model in [Figure 1](#). This left the gap that this study aims to fill.

2.3 Conceptual model for the study

3. Methods

3.1 Research design

The study aims to investigate PIS in driving employee productivity amid the COVID-19 pandemic among bank employees in Lagos Metropolis. The study followed a positivism philosophy which is supported by the notion that there is an objective reality which can be explained factually using empirical data. To achieve the purpose of this study, the cross-sectional and descriptive research design was adopted and the study was quantitative. A descriptive research design was deemed fit because the study aims to classify, quantify, and compare a phenomenon by attempting to describe an existing scenario through the collection of primary data. It also allows the researcher the opportunity to provide a detailed representation of the variables of the study.

Nevertheless, because cross-sectional studies only record information at one moment in time, it is difficult to ascertain the temporal order of events over time, which restricts the capacity to track changes or advancements in the variables of interest. The study focused on employees in the banks within Lagos Metropolis. Lagos was chosen because it serves the double purpose of being the former capital of Nigeria and the commercial hub of the country. Survey questionnaires were used to collect relevant data from the participants of the study. The reason for using a questionnaire is the wide outreach and the low cost compared to other forms of collection of data.

3.2 Population and sample of the study

The population of the study consists of all the employees in the 23 banks that survived the recapitalization of the Nigerian banks in 2005 and are listed on the Nigeria Stock Exchange. The population consists of 94, 498 ([National Bureau of Statistics, 2020](#)). Convenience

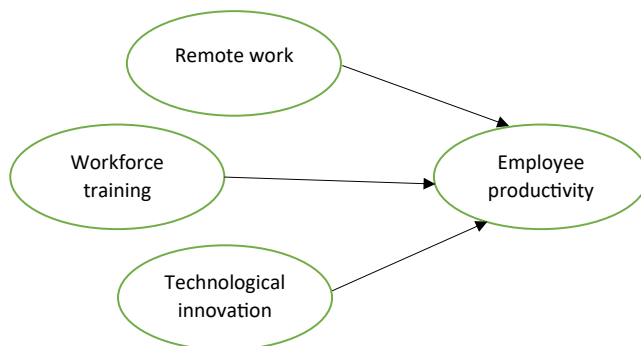


Figure 1. Conceptual model for the study indicating the relationship between remote work, workforce training, technological innovation and employee productivity

Source(s): Researchers' initiative (2022)

sampling was applied in selecting 14 banks from the 23 banks. Convenience sampling was preferred because of the sample accessibility and proximity to the researcher as the researcher used some research assistants who were known to him and were part and parcel of the study organizations (Zikmund, 2000). A stratified sampling technique was used to divide the respondents into three strata comprising top, middle, and low management levels. This was so in order to have general views across all the levels of the organization (Sekaran and Bougie, 2010).

Thereafter, simple random sampling was applied in selecting the 1,097 respondents after applying the online calculator to calculate the sample size with a 3% sampling error and a confidence level of 95%. The purpose of using simple random sampling was to eradicate the issue of bias thereby allowing each respondent to be represented in the study (Saunders *et al.*, 2009). Moreover, out of 1,097 distributed questionnaires, 900 were considered appropriate for this study after 197 were rejected for various reasons including incomplete fillings, thereby yielding an 82% response rate. This is considered appropriate because Sekaran and Bougie (2010) opined that for most studies with sample sizes greater than 500, 70% of the total questionnaire recovered is adequate for the study.

3.3 Research instruments

To achieve the purpose of this research, the study gathered the required data through a structured questionnaire. The questionnaire contained two sections: A and B. In Section A, the questions were used to collect relevant information about the personal demographic background of the respondents like age marital status, education, and gender; and then Section B contained relevant questions which were centered on the major variables of the study. All variables were measured on a 5-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. As a result, remote work was measured by adapting a 17-item scale developed by Grant *et al.* (2019). Sample items are 'I know what it takes to be an effective e-worker, and 'When e-working I can concentrate better on my work tasks'.

The measure of workforce training was adapted from the item scale Organizational Climate Questionnaire (OCQ) from a 7-item scale developed by Furnham and Goodstein (1997). A sample item is 'I have received the training I need to do a good job'. Technological innovation was measured using a 5-item scale adapted from the Organizational Climate Questionnaire (OCQ) scale developed by Furnham and Goodstein (1997). A sample item is 'The company responds swiftly to new technical innovations'. A 10-item scale adapted from Endicott and Nee (1997) known as the Endicott Work Productivity Scale (EWPS) (1997) which quantifies employees' attitudes and behavior toward work productivity was used to measure employee productivity. A sample item is 'I noticed that my efficiency is higher than expected'.

The demographic data of the respondents revealed that 36.0% of the respondents fall within the active age range of 30–49 years. 28.9% fall between the ages 40–49 years, 20.3% are 50 years and above and 14.8% are between the age range 20–29 years. Concerning marital status, 72.0% of the respondents were married, 21.7% were single, 0.8% were widowed, 3.4% were divorced and 2.1% were separated. In terms of gender, 51.3% of the respondents were male and the female constituted 48.7%. Additionally, results for respondents' educational qualifications revealed that 51.8% and 42.6% of the respondents reported that they have HND/B.Sc. and M.Sc./MBA/M. Ed. The results on work experience revealed that 49.6% of the respondents reported having work experience of 6–10 years, 20.0% reported having work experience of 1–5 years, 19.8% had work experience of 11–15 years, and 10.6% had work experience of 16 years or more. Finally, the result on the management level showed that over 89.2% of the respondents share low and middle management levels while 10.8% of the respondents were at the top management level.

3.4 *Validity and reliability of instrument*

Following the submissions of Green (2008), validity refers to the precision with which the researcher estimates the causal effect(s) of the independent variable constructs on the dependent variable. The validity of the study instrument was assessed with the assistance of experts in the area of management studies. The instrument was critiqued and some adjustment was suggested and included in the instrument design to establish face and content validity. However, to test for the instrument’s reliability Cronbach alpha coefficients were generated for the questionnaire with a pilot study of 50 respondents different from the main study. To establish internal consistency for the study’s instrument (Rojon and Saunders, 2012).

Pallant and Tennant (2007) suggested that in most social science study contexts, a reliability coefficient of 0.70 or higher is regarded as “appropriate”. The reliability of the scales was remote work 0.850; workforce training 0.820, and technological innovations 0.860 and employee productivity, 0.930 as depicted in Table 1, and considering Pallant and Tennant (2007)’s suggestion, they were reliable. To reduce social desirability and common bias methods, the study ensures participants feel comfortable offering honest responses by guaranteeing anonymity and confidentiality of their responses. Similarly, randomizing the order of questions was done to reduce the impact of question order on responses.

3.5 *Data capture and data analysis*

The computer-aided package known as the Statistical Package for Social Sciences (SPSS) version 26 was employed to analyze data. Frequency tables were used to analyze the demographic characteristics. Correlation and simple linear regression analysis were employed in this study. The reason for using correlation is to show the link among the variables (Field, 2017). The study used simple regression because it wanted to measure the strength as well as the predictive abilities of the predictor variables on the outcome variable (Field, 2017).

The justification for using simple regression instead of structural equation modeling (SEM) is because the model is simplistic and not complicated set of relationships (Montgomery et al., 2021; Neter et al., 1983). The justification for one-tailed hypothesis stem from the fact that the literature provided explicit directional predictions about the outcomes of study variables based on theoretical reasons and/or practical considerations (Ellis, 2010; Ruxton and Neuhäuser, 2010). Lastly, the data is collected at different points in time but across different units (cross-sectional), as a result there might be autocorrelation present due to temporal dependencies within each unit, hence, the use of Durban Watson test.

4. **Results and interpretations**

4.1 *Correlation among the study variables*

The above Table 2 shows the correlation among the variables in this study. The result revealed that all the dimensions of process improvement strategies had positive and

Variables	Number of items	Cronbach alpha (α)	Remark
Employee productivity	10	0.930	Reliable
Workforce training	7	0.820	Reliable
Remote work	17	0.850	Reliable
Technological innovation	5	0.860	Reliable
Total	39		

Table 1.
Reliability results of
the study instrument

Source(s): Reliability computation from SPSS version 26

significant relationships with employee productivity; that is, remote work ($r = 0.880^*$; $p < 0.01$); workforce training ($r = 0.706^*$; $p < 0.01$); and technological innovation ($r = 0.697^*$; $p < 0.01$). This means that as each of these variable increases, employee productivity tends to increase accordingly with remote work having the most significant relationship with employee productivity, followed by workforce training. Correlation being a pretest, the study cannot conclude that these dimensions can cause employee productivity. It can only show the relationship between/among variables (Field, 2017).

4.2 Data analysis and test of hypotheses

H01: There is no significant positive relationship between remote work of staff and employee productivity amid the Covid-19 pandemic among bank employees.

Table 3 above shows the simple regression analysis of the study to predict employee productivity based on the remote work of bankers among bank employees. A significant regression equation was found ($F \{1, 898\} = 3095.612, p = 0.000$), with an R^2 of 0.775, implying that remote work explains 77.5% of the variation in employee productivity; i.e. 22.5% of the variation in employee productivity is explained by factors outside remote work. The F value reveals that the model is a good fit and a significant predictor of employee productivity.

Respondents predict employee productivity is equal to $0.543 + 0.860$ (Remote work). This implies that employee productivity increases by 0.860 units for every unit increase in remote work. The T-statistics ($t = 55.638; p = 0.000$), show that hypothesis one is significantly different from zero. That is remote work results in improved employee productivity. The Durban Watson result shows that there is positive auto-correlation at 1.376. Therefore, there are good reasons to reject the null hypothesis one (H01) and accept the alternative hypothesis one (H101) and conclude there is a significant positive relationship between remote work and employee productivity amid COVID-19 pandemic among bank employees.

Correlation Factor	Mean	SD	CR	1	2	3	4
EMPPRO	4.193	0.551	0.930	–			
RMWK	4.246	0.564	0.820	0.880	–		
WRKFTR	4.120	0.673	0.850	0.706	0.790	–	
TECHINN	4.119	0.695	0.860	0.697	0.786	0.946	–

Note(s): $**p < 0.01$. SD: Standard Deviation; EMPPRO: Employee Productivity (1); RMWK: Remote Work (2); WRKFTR: Work Force Training (3); TECHINN: Technological Innovation (4); CR: Composite Reliability. *Computation of Mean, Standard Deviation and Correlation from Survey Data using SPSS version 26

Table 2. Mean, standard deviation, and correlation between the variables of the study

Variables	B	Beta	R	R ²	T-value	F-value	Sig	D.Watson
Constant	0.543							
Remote work	0.860	0.880	0.880	0.775	55.638	3095.612	0.000	1.376

Note(s): Outcome Variable: Employee Productivity

Degree of freedom = (1,898)

Source(s): Field Survey, 2022

Table 3. Data analysis for Hypothesis one

H02: Workforce training does not favorably impact employee productivity amid COVID-19 pandemic among bank employees.

Table 4 shows the model summary from the simple regression analysis for testing hypothesis two. The simple regression reveals a significant regression equation of ($F \{1, 898\} = 849.370, p = 0.000$), with an R^2 of 0.49.9. This means that workforce training explains 49.9% of the variation in employee productivity; leaving 50.1% of the variation in employee productivity explained by factors outside remote work. The F value reveals that the model is a good fit and a significant predictor of employee productivity.

Respondents predict employee productivity equal to $1.811 + 0.578$ (Workforce training). This implies that employee productivity increases by 0.578 units for every unit increase in workforce training. The T-statistics of $t = 29.906; p = 0.000$, shows that hypothesis one is significantly different from zero; implying that workforce training results in improved employee productivity. The Durban Watson result shows that there is positive auto-correlation at 1.297. Therefore, there are good reasons to reject the null hypothesis two and accept the alternative hypothesis two. The study, therefore, concludes that **H02** which states workforce training does not favorably impact employee productivity amid the COVID-19 pandemic among bank employees was not supported. This implies that alternative hypothesis two (**H102**) was supported.

H03: Technology innovation does not positively impact employee productivity the amid Covid-19 pandemic among bank employees.

Table 5 shows the model summary from the regression analysis for the study. R^2 equals 0.486. This implies that 48.6% of the total variation in employee productivity is explained by technological innovation, implying that as much as 51.4% cannot be explained. It shows that the model was moderately strong and this served as enough ground to determine the relationship between the two variables. Additionally, the F- statistics value ($F = 849.343; p = 0.000$), indicates that the model is good for use in the research area and that it is statistically significant in explaining variation in employee productivity.

Respondents predict employee productivity is equal to $0.1.917 + 0.553$ (Technological innovation). This implies that employee productivity increases by 0.553 units for every unit increase in technological innovation. The T-statistics which is reveals that $t = 29.143; p = 0.000$. This means that the hypothesis is significantly different from zero. Therefore, there are good reasons to reject null hypothesis three (**H03**) and accept alternative hypothesis three

Table 4.
Data analysis for
Hypothesis two

Variables	B	Beta	R	R2	T-value	F-value	Sig	D.Watson
Constant	1.811							
Workforce training	0.578	0.706	0.706	0.499	29.906	849.370	0.000	1.297

Note(s): Outcome Variable: Employee Productivity
Degree of freedom = (1,898)
Source(s): Field Survey, 2022

Table 5.
Data analysis for
Hypothesis three

Variables	B	Beta	R	R2	T-value	F-value	Sig	D.Watson
Constant	1.917							
Technological Innovation	0.553	0.697	0.697	0.486	29.143	849.343	0.000	1.349

Note(s): Outcome Variable: Employee Productivity
Degree of freedom = (1,898)
Source(s): Field Survey, 2022

(H103). The Durban Watson result shows that there is positive auto-correlation at 1.349. The study, therefore, concludes that technological innovation has an impact on employee productivity amid the COVID-19 pandemic among bank employees.

5. Discussions

The data analysis for this study was conducted by examining, cleaning, converting, and interpreting data in order to draw conclusions that are relevant to the situation and make informed decisions on empirical data and statistical inferences. Therefore, this study utilized simple linear regression because of its simplicity, and due to the fewer variables involved. This choice ensured a straightforward relationship between the variables, minimizing complex interdependencies and facilitating easier data analysis and interpretation (Gordon, 1968; Knight, 2018). Hence, the hypotheses were subjected to test using simple linear regression as shown below.

The findings are significant since all of the predictors had strong associations with the outcome variable. To begin with, null hypothesis one was not supported, and the research question “(a) To what extent does remote work influence employee productivity amid the COVID-19 pandemic among bank employees in Lagos Metropolis?” was answered. That is, as a result of the COVID-19 pandemic, the bulk of employees have switched from a physical office setup to a work-from-home model, and this results in an increase in the employees’ productivity. Accordingly, this implies that workers who are accustomed to working in an office setting made a smooth transition to the remote work model with no disruption to their productivity, ushering in a new era for banking in emerging economies. This implies that bank employees who opted not to work from home were suddenly required to do so and the nature of the pandemic dictates that employees work from home in most cases. This outcome is consistent with the majority of research findings of Jonathan (2019) and Grant *et al.* (2019). However, the result is not consistent with the opinions of Taser *et al.* (2022).

The test for hypothesis two follows the same trend as illustrated in the results of hypothesis one. The outcome of the result also shows a significant relationship between workforce training and employee productivity, thereby answering the second research question “(b) What influence does workforce training have on employee productivity amid the COVID-19 pandemic among bank employees in Lagos Metropolis?” That is, employees in the banks undergo enough training and thereby gain new knowledge, skills, and abilities to handle work and be effective during the pandemic. As a consequence, they are more flexible, highly productive, personal customer service oriented, inventive, and perform exceptionally and comfortably. This viewpoint is supported by publications like Zaman *et al.* (2020), Nwaeke and Obiekwe (2017) and Kan (2012) who emphasize the importance of workforce training as a foundation for increased employee productivity in any firm as aptly proven in the current study on bank employees in Lagos Metropolis. However, this result disagrees with the conclusions of Cole (2008) who averred that training does not give them the requisite, sufficient, and adequate knowledge and skills needed.

Finally, alternative hypothesis three was also supported and the research question “(c) to what extent does technological innovation enhance employee productivity amid the COVID-19 pandemic among bank employees in Lagos Metropolis?” was attended to. That is investing in state-of-the-art technology has a positive impact on employee productivity. This means that the respondents were of the opinion that technological advancements and the introduction of new technologies have positive effects on employee productivity. This means that outmoded technologies were not used in banks. Instead, banks focused on investments in new technologies.

Therefore, investment in upgrading to the most recent technologies in branch networking, real-time payment, Point of Sales (POS), internet banking, Automatic Teller Machine (ATM)

mobile Apps, money dispensers, personal computer banking, telephone banking, and electronic bank transfer, virtual meetings, information sharing, secure online portals, reducing the need for in-person interactions, document version control, automated workflows, and digital signatures, which speed up decision-making and streamline processes, as well as collaboration on projects, etc. These technologies let teams work effectively together, share knowledge, and make decisions, which are common sights, got the job done for the employees and the bank management, and resulted in excellent employee productivity during the pandemic. The results are in line with the submissions of [Igudia \(2021\)](#) and [Coppersmith \(2019\)](#) and the BPR theory introduced by [Hammer et al. \(1993\)](#) where the emphasis is placed on the constant improvement of processes brought about by investing in the latest technological innovations. However, it contradicts the conclusions of [Brynjolfsson and Hitt; \(2003\)](#) and [Davenport \(1993\)](#).

6. Conclusion and recommendations

The study concludes that process improvement is at the foundation of any well-managed organization, whether learning from past successes or mistakes, discovering possibilities to enhance customer profitability, or enabling staff to become more productive, especially during an unprecedented period like the COVID-19 pandemic. Working from home is better suited for enhancing employee productivity amid pandemic periods. However, allowing individuals to work from home may be based on the average level of productivity at home versus at work. Despite the fact that most employees try to fight the new method, it is necessary for the workforce to be trained. There will be many mistakes, mishaps, and inefficiencies in the workforce's activities if they are not properly trained on how to work from home. To succeed in business, banks must maintain their heads above water in terms of getting the most up-to-date technologies to be able to adjust to the 'new norm'.

The study recommends that to enable smooth collaboration across distant teams, bank management should make investments in dependable video conferencing, project management, and communication solutions. Bank management should set up flexible work rules, such as flexible hours and remote work possibilities according to employment titles and responsibilities, to meet the demands of staff members during the epidemic. Additionally, in order to effectively support employees' transition to remote work environments, cybersecurity awareness and stress management strategies should be promoted. Remote training sessions on best practices for remote work should also be devised and provided. In addition, bank management have to provide specialized training courses to improve staff members' digital competencies, such as their ability to use banking software, data analytics tools, and remote customer relationship management (CRM) systems.

Regular training sessions on compliance laws, risk management procedures, and fraud prevention techniques should be held by bank management, with a focus on how crucial they are in remote work environments. Employees should receive training on resilience-building strategies, virtual team management, time management and effective communication to help them succeed in demanding and remote work situations. In order to improve operational effectiveness and customer experience, bank management should expedite digital transformation initiatives like online account opening, digital payments, AI-powered customer support, and automated loan processing. It is recommended to make use of data analytics solutions to track the performance indicators of remote workers, spot productivity snags, and offer tailored coaching and support when required. Bank management should promote an innovative culture by encouraging staff members to suggest and execute new ideas to streamline procedures, enhance services, and adjust to changing customers' needs.

7. Theoretical and practical implications of the study

The two theories that informed the study were supported. For instance, the study concludes that the banking industry adopts the work-from-home strategy, an accomplishment that was lacking in the banking industry before the advent of the pandemic in Lagos, Nigeria. Therefore, during the pandemic, engaging employees in training and development to adjust to the new normal, acquiring and implementing cutting-edge technologies for upgrades, and applying remote work all aided in fostering employee productivity.

The study supports the contingency theory by highlighting the need for adaptation in response to changing circumstances initiated by the pandemic. Process improvement strategies are required to be adaptable and quick to respond to the fresh challenges influencing worker productivity during the pandemic. Bank mobile apps, debit card transactions, the introduction of Automated Teller Machines (ATMs), and point of sale terminals (POS) were upgraded, enhanced, or increased in usage in response to the unique demands and requirements brought up by the pandemic. The use of Zoom/Microsoft Team to facilitate virtual meetings and collaborate remote teams were other good examples.

The study offers useful information to policymakers and bank management regarding strategies for process improvement that the banking industry can employ both during and after the COVID-19 pandemic. Banks can streamline operations, and improve overall employee productivity by identifying bottlenecks and inefficiencies in current processes and improving on it. This can entail putting in place flexible work schedules and offering assistance for working remotely because in times of uncertainty, flexibility is essential to sustaining employee productivity. The study shows that technology affects bank employees' productivity as the pandemic necessitates distant work and few in-person interactions.

Similarly, conclusions from this study might be utilized to identify programs for training and upskilling on topics such as digital tool competence, compliance requirements, risk management, and fraud prevention techniques, as well as best practices for remote work, to fill certain gaps that were apparent during the pandemic. Put another way, banks should invest in training programs to equip staff with the expertise to adjust to changing circumstances, and dramatically enhance their business operations. In addition, the implementation of PIS will result in a win-win situation by promoting a small workforce on the workplace grounds (physical office work), promoting social distancing, and preventing the spread of the dreaded diseases that may be brought on by close personal contact among the employees; at the same time enhancing employee productivity. Likewise, the study will serve as a guide for strategies/interventions by the CEO/Head-HR of the banks in prioritizing initiatives that enhance process efficiency, support remote work arrangements, invest in employee training, and enable banks to stay competitive in a rapidly evolving landscape. Last but not least, the study will serve as a guide for students who might want to conduct research in similar endeavors in the future.

8. Suggestions for further research

There are a few promising areas for future research that are worth considering. Other such as creativity, organizational culture, organizational climate, and other dispositional and working environment elements that may influence employee productivity should be included in future studies in order to have a more robust outcome. Aside from that, future research should include respondents from various industries in order to obtain more precise results that contribute to employee productivity in certain industries. In addition, future research should investigate workforce training as a mediating variable since it was treated as an independent variable in this study. This study is a cross-sectional study, and as such, the data for this study were retrieved immediately after the pandemic (between 2021–2022). To detect any possible changes or trends over time, data might be regularly collected after the

pandemic to analyze the longitudinal impact of the pandemic on the variables examined in this study. This would provide researchers a more thorough grasp of the pandemic's long-term effects on the variables under study and how those effects change over time.

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