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Article

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An Exploration of the Relationship between Technostress, Employee Engagement and Job Design from the Nigerian Banking Employee's Perspective

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Abstract. *The introduction of technology in the banking sector has induced benefits to this sector. ICTs has facilitated the delivery of efficient and reliable banking services. Despite all the benefits associated with the use of technology, organizational researchers have argued that technology is a double-edged sword because its ability to induce stress in its users, this kind of anxiety is technostress, a strain that is caused by the lack of knowledge of individuals to cope and adapt to the use of technologies. The increasing use of technologies has resulted in work-family conflict, role-overload, work-overload, and multi-tasking. Additionally, technologies have resulted in consistent task reengineering, which has created knowledge gaps for employees. Past studies on technostress have demonstrated that can affect employees, performances, organizational commitment, and job satisfaction. However, the association of technostress with employee engagement and job design has not been established. Hence, the objective of this current study is to explore the association of job design with technostress and employee and the impact of technostress on employee engagement. Using a purposive sampling method, a total of 319 Participants were recruited from front desk employees of the Nigerian commercial banks and data has been analyzed using smart PLS. The findings of the study show a significant positive relationship between job design and technostress and positive relationship between technostress and employee engagement contrary to the negative relationship proposed based on the stress and engagement literature is an indication that job design alone may not reduce the impact of technostress if other organizational-stressors are not addressed. While technostress does not reduce employee engagement instead a moderate level of stress can serve as a motivator, but extreme stress can have a damaging impact on employees and the organization. Equally, the study also found a positive association between job design and employee engagement, while technostress has a mediating effect on job design and employee engagement.*

Keywords: *technostress; job design; employee engagement; information technology; bank employees.*

Introduction

Today's business atmosphere is incredibly dynamic and has undergone fast changes as a result of technological innovation. Particularly the banking industry of the twenty-first century operates in an exceedingly complicated and competitive atmosphere characterized by these ever-changing conditions and extremely unpredictable financial climate. The application of technological innovation in the services and operations of banks has become an issue of fundamental importance and prerequisite for global competitiveness (Oluwagbemi, Abah, & Achimugu, 2011). Despite the advantages of using technology, scholars believed that technology is a double-edged sword because it is responsible for inducing stress in the lives of its users (Tarafdar, Pullins, & Ragu-Nathan, 2014). This kind of strain is referred to as technostress a type of uneasiness that originates as a result of the inability of employees to cope with the use of technology in a healthy manner (Ayyagari, Grover, & Purvis, 2011). A growing body of organizational researches is concerned about identifying precursors and effects of technostress on employees and organizations. Already published studies have shown that technostress can affect employees job satisfaction, performance, organizational commitment and employee intention to extend the use of ICTs (Ahmad, Amin, & Ismail, 2009; Ayyagari et al., 2011; Tarafdar et al., 2014).

Nevertheless, numerous researches have investigated technostress in several contexts, some studies (Fieseler, Grubenmann, Meckel, & Muller, 2014; Kumar, Lal, Bansal, & Sharma, 2013; Rajput, Gupta, Kesharwani, & Ralli, 2011; Tarafdar et al., 2014; Weiner, Maier, Laumer, & Weitzel, 2014) have examined the impact of technostress on professionals (supply chain managers, IT professionals, sales, etc.) Telemedicine (Yan, Guo, Lee, & Vogel, 2013) and on Smartphones. There is a limited study on technostress in Nigeria, particularly in the commercial banking sector. Likewise, previous researches have mainly focused on a few causes and effect of technostress. Nevertheless, they have neglected the impact of job design on the perception of technostress. The nature of Job design and characteristic can determine employees' stress level. Thus, it is vital to examine how job design can collectively influence technostress among banking employees in Nigeria. Giving the competitive nature of the banking industry in Nigeria, new technology-based products and services are on the increase

Furthermore, the effect of technostress on employees' engagement has not been explored. Past researches have shown that stress can affect an employee's engagement. This gap limited our understanding of the causes and effect of technostress on employees and organizations. Understanding the relationship between job design employee engagement and technostress would provide a more practical intervention and strategies to alleviate the impact of technostress on employee engagement. In other to close these gaps, this study has integrated job design and employee engagement into the technostress research model (see figure1). Job design represents organizational-based factors that influence technostress and employee engagement. Next we present

our literature review, structural model and hypothesis, sample, methods and results, and lastly, conclude with theoretical and practical implications of the study.

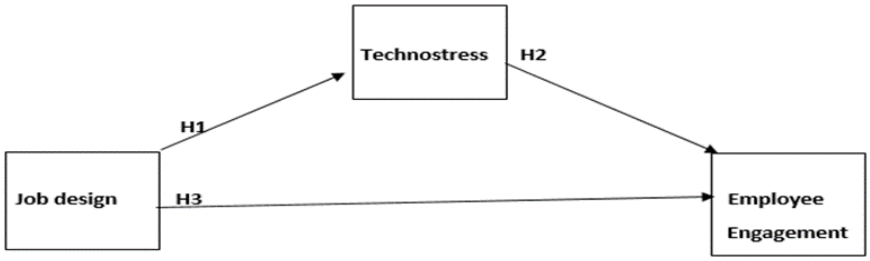

Figure 1. Research model

Literature review

Technostress

The terminology technostress originated from Brod (1984, p.16). He defined technostress "a modern disease of adaptation caused by an inability to cope with the new computer technologies healthily". Accordingly, Arnetz and Wiholm (1997) referred to technostress as "a state of arousal" prominent in employees who depend on computers for their routine task. Although prior researches on stress concentrated on the physical consequences technostress in organizations, such as fatigue, irritability headache, and restlessness (Arnett & Wiholm, 1997). While the current research has concentrated on the psychological states that create technostress by differentiating between the causes of stress (stressors) and the outcome of stress (strain) (Suh & Lee, 2017).

The technostress model is composed of the five technostress creating conditions. Foremost, is "Techno-overload" " that portrays circumstances whereby utilization of ICTs increases employee's workload and compel them to work faster (Suh & Lee, 2017). Attempting to accomplish additional in less time, and encountering pressure and nervousness. Techno-overload is in multi-tasking, especially in the banking job, were employees utilize a variety of banking application simultaneously. Second is "Techno-invasion" that depicts circumstances in which employees can presumably be contacted anywhere and no matter the time and feel they must be continually connected (Tarafdar et al., 2014) especially in baking were employees email official can be accessed' on mobile phones. It also connotes a situation in which working hours spills into an individual personal time because of persistent availableness, which results in work-family conflict (Tarafdar, Tu, Ragu-Nathan, & Ragu-Nathan, 2011). The third is "Techno-complexity*",* a complex system is a system with high functionalities, and the higher the functionalities, the higher the level of technostress. Techno-complexity portrays circumstances whereby ICT sophistication compels banking employees to invest time and energy in learning and re-learning how to utilize new banking applications. Employees may perceive the assortment of functions and application complex and be exhausting to grasp, and therefore feel stressed (Tarafdar et al., 2011). The fourth is "Techno-insecurity" a situation that rises because workers feel destabilized by the fear

of losing their jobs to people who have a superior comprehension of latest (Tarafdar et al., 2011). Last of all, is "Techno-uncertainty" that alludes to conditions whereby constant changes and upgrades of Information technology and applications do not permit employees or users to accumulate knowledge and expertise for a particular system or application. They consider this unsettling because their skills and experience will become obsolete because of the technological pace of change result in frustration and perceived inability to cope thereby resulting in fear of been replaced (Tarafdar et al., 2011).

Applying the person-environment fit theory of stress to technostress

The person-environment fit (P-E fit) theory of stress is one of the most popular stress theory utilized by organizational researchers in stress studies (Chuang, Shen, & Judge, 2015; Kaur & Dubey, 2014; Nguyen & Borteyrou, 2016). Therefore, is present study uses the P-E fit theory as the underpinning theory for technostress. The P-E fit theory of stress assumes that a misfit between an individual with its environment can lead to strain. In principle, stressors originate from a gap or misfit between an individual and its environment. Misfit may occur between a person and the resources supplied by the environment (organization) to fulfill those values (Cooper, Dewe, & O'Driscoll, 2001). The application of P-E fit theory of stress to the technostress concept in the current study on the augment that the use of ICTs can increase value-supply and ability-demand misfit for employees. In other words, the use of technologies creates excessive demand which results in ability-demand gap or misfit. While value-supply misfit or gap exists when the use of technologies by individuals conflicts with their values Take, for instance, an employee may value his or her privacy and job security, but due to the intrusive nature of ICTs, such individual may experience misfit and job insecurity, at such the individual may be resistance to technological adoption. Secondly, misfit can occur between an individual's abilities and the demands placed upon them by the environment. The environment in the context of this study is the technological environment. An example of a misfit in this current study is the demands placed on an individual's attention by technologies. The persistent connectivity of individuals to various kinds of technologies or collaborative software has created a sense of urgency, which can affect an individual time and energy can lead to strain. Similarly, technologies have created a sense of urgency, and employees are under pressure to multi-task and work faster, as such the demand on them exceeds their abilities thereby resulting in nervousness and anxiety.

Employee engagement

The term employee engagement has increasingly become a widespread concept in the organization and among organizational behavior researchers (Robinson, Perryman, & Hayday, 2004). However, there majority of the literature about employee engagement can found in a practitioner journal which is focused on practice instead of on empirical studies. Many scholars have defined employee engagement. Some explained engagement as a commitment to an organization intellectually and emotionally (Richman, 2006) or the degree of discretionary vigor displayed by employees on their

works. Academic literature has defined engagement from various perspective. According to Kahn (1990, p.694) personal engagement as "the harnessing of organization members 'selves to their work roles; in engagement, people employ and express themselves physically, cognitively, and emotionally during role performances" While Personal disengagement is "the uncoupling of selves from work roles; in disengagement, people withdraw and defend themselves physically, cognitively, or emotionally during role performances" (Kahn, 1990, p.694).

Additionally, job burnout literature described engagement as the reverse or opposite of burnout (Maslach, Schaufeli, & Leiter, 2001). The characteristics of employee engagement include efficacy, energy and involvement, which is the reverse of the three dimensions of burnout, inefficacy, exhaustion and cynicism (Maslach et al., 2001). Additionally, previous studies on burnout and engagement have demonstrated that the essential dimension of burnout (cynicism and exhaustion) and core dimensions of employee engagement (dedication and vigor) have opposite meaning (González-Romá, Schaufeli, Bakker, & Lloret, 2006). While Schaufeli, Salanova, González-Romá, and Bakker (2002, p.74) argued that Engagement is not a transitory or explicit state, instead of a "positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption". They argued that engagement is "a more persistent and pervasive affective-cognitive state that is not focused on any particular object, event, individual, or behavior" (Schaufeli et al., 2002, p.74). Within the context of this present study employee engagement is described as the extent to which an individual employ themselves in their task performance. Furthermore, employee engagement involves a vigorous and deliberate application of an individual's emotions, conduct and cognition during task performance.

Social exchange theory

In exploring the relationship between job design and employee engagement in this current study the social exchange theory is applicable. The social exchange theory (SET) is one of the essential approaches used in explaining the organization-employee relationship or behavior (Cropanzano & Mitchell, 2005; Cropanzano, Anthony, Daniel, & Hall, 2016). The underlying assumption of SET is that obligation is created via sequences of an interface between entities involved in a reciprocal interdependence. Accordingly, Cropanzano and Mitchel (2005) have identified three kinds of relationship in the process of social exchange. These include independence, dependence and interdependence. They argued that total independence and total dependence do not portray a social exchange, insisting that an exchange is a bi-directional transaction whereby something is given out, and something is given back in return. Their argument is consistent with the description of engagement by Robinson et al. (2004). The described engagement as a two-way relationship that exists between an employer and its employee.

Using the social exchange theory to support the relationship between job design and employee engagement Saks (2006, p.603) maintained that "One way for individuals to repay their organization is through their level of engagement. That is, employees will choose to engage themselves in varying degrees and response to the resources they

receive from their organization". An employee would want to commit themselves at a various level based on the resources they receive from their organization (Saks, 2006). Thus, when employees have autonomy, task identity, task significance, task feedback, skill variety and receive organizational support and development opportunities, they will reciprocate by an increased level of engagement.

Job characteristic model

The characteristic job Model (JCM) is amongst the most critical theories propounded in the area of organizational behavior. It is a foundation for researches and job redesign in the past decades. The job characteristic model has been compressively reviewed (Fried & Ferris, 1987; Loher, Noe, Moeller, & Fitzerald, 1985; Taber & Taylor, 1990). The majority of this study has validated and supported the JCM. Even though critiques and modification of the model had been suggested by some researchers (Salancik & Pfeffer, 1978). Hackman and Oldham (1980) postulated the Job characteristic model in 1978 and modified in 1980. Accordingly, Faturochman (1997, p.1) defined the job characteristics model as "the relationship between job characteristics and individual responses to work. The theory specifies the task condition in which individuals are predicted to prosper in their work". Accordingly, the job characteristic model proposes that the five core job characteristics (Task feedback, task autonomy, task significance, task identity and skill variety) has an impact on the three psychological states (responsibility for outcomes, experienced meaningfulness and the knowledge of the actual results) which in reciprocity affect work-related issues (motivation, satisfaction, turn over intention and absenteeism). The job characteristic model has argued that a high level of motivation leads to the three psychological states;

Responsibility: Individual's employee should have the opportunity to make changes to their job and integrate their knowledge and experience in performing their task. In this case, such an individual takes personal responsibility for the failure or success of the work completed.

Work Meaningfulness: It is a sense of fulfillment an individual's feel after performing a particular task. An employee may view their job as meaningful if their job changes or improve the well-being and or welfare of people. In other work, jobs that create a positive impact can be fulfilling for individuals who performed such a task. Work meaningfulness is essential to intrinsic motivation of employees.

Knowledge of outcomes: Individual need to receive timely and accurate feedback on the impact of their jobs. It infers an employee's awareness of his or her performance at work. Such as feedbacks from customer's satisfaction statistics or production records. Feedback can be gotten from supervisors, colleagues, customers or from the job itself.

Accordingly, the five core job characteristics would lead to the above mentioned three psychological states which will, in turn, support positive organizational outcomes such as job satisfaction. Whereas, if any of the above is lacking their will low motivation and decreased job satisfaction. The oppositions that the job characteristic model is from the Herzberg's (1966) motivation-hygiene theory that argued that if organization want to

increase employee's job satisfaction and performance, there is a need for job enrichment rather than job simplification. However, within the context of this study job characteristic model is used as the supporting theory for job design in other to explore the relationship between job design and technostress.

Job design and technostress

Job design in the context of this study is based on the Job Characteristics Model (JCM) by Hackman and Oldham (1980) which propounded the five essential job characteristics that motivate employees. These characteristics include; firstly, task variety, which is the degree to which a task involves a range of skills to be accomplished or the extent expected an individual perform multiple functions. For instance, a bank teller job requires varieties of skills, because they provide banking services such as receipt and payment of cash, selling bank drafts, traveler's checks, attending customers inquires, booking of investments and loans. The second is task identity, is the extent to which an individual can start and complete a task individually, for example resolving a customer's complaint. Third is task significance, it the level of impact a job has on the lives of people. Employees may find fulfillment from their jobs when it changes or improves the well-being of others, for instance, when a bank officer approves loans for small business and the recipients can grow their businesses and develop their living standard. Fourth is task autonomy, is the degree to which an employee can make decisions on how they want to perform their task. Task autonomy is often very low in banking jobs because various transactions need to go through oversights to prevent fraud and financial losses. Lastly is task feedback, it is the extent to extent to which an employee receives accurate and timely information regarding their task performance.

Furthering the thought on the relationship between job design and technostress, these five essential components of job design are expected to elevate positive attitudinal and behavioral outcomes. An employee with a low level of any of the job mentioned above design characteristic is more likely to experience misfit between them and their job which can lead to technostress, thus affecting employee job satisfaction vice versa. For instance, the Humphrey, Nahrgang, and Morgeson (2007) meta-investigation demonstrated that job characteristics (e.g., autonomy, working conditions, feedback, task identity,) were associated negatively and in a direct manner to the results of stress and fatigue. These outcomes propose that working under poor conditions and on job low on the motivational attributes can antagonistically affect worker psychological well-being (Sageer, Rafat, & Agarwal, 2012). In other words, lack of autonomy, skill variety, task significance, task identity, task feedback can amplify the perception of technostress. For example, considering the nature and structure of banking task, there is limited, task identity, task autonomy, were a single employee is not allowed to initiate and complete without going through the process of verification by various line officers through technology interdependency. Thus, the sense of task identity is not present. This situation may amplify the perception of technostress among employees. Therefore, we proposed that following hypothesis:

H1. There is a negative relationship between job design and technostress.

Technostress and employee engagement

The variable employee engagement was at first defined by Kahn (1990, p.694) as "the harnessing of organizational members 'selves to their work roles". What is central in Kahn's (1990) viewpoint is the measure of vitality and sense of commitment that employees have for work, and the manner in which they employ and express themselves physically, cognitively, and emotionally during role performances. An employee who is engaged is vigorously and viably associated with their work, as they are physical, psychologically and sincerely involved (Tims, Bakker, & Derks, 2013). While disengaged employees are emotionally separated with work and even physically less involved (Truss, Shantz, Soane, Alfes, & Delbridge, 2013). In this present study employee engagement is based on Saks (2006) components of employee engagement. Accordingly, Saks (2006) divided employee engagement into job engagement and organizations engagement. Furthering the thought on the relationship between technostress and employee engagement. Researches Kahn (1990) proposed emotional, physical and psychological resources are an essential precondition for engaging at work. Therefore, those physical and emotional resources may be depleted due to technostress, that means employees may become disengaged. Contrarily, disengaged employees detach themselves from work physically and withdraw emotionally and cognitively and resulting week role performance and effortless, robotic task performance behaviors (Ongori & Agolla, 2008). Therefore, we argue that technostress is theoretically related to employee engagement. Stress literature commonly proposed a negative relationship between work-related stress and employee engagement (Velnampy & Aravinthan, 2013) which imply an excessive level of technostress decreases employee engagement. Therefore, we hypothesized as follow:

H2. Technostress is negatively related to employee engagement.

Job design and employee engagement

According to Michael Armstrong (2003), Job Design is the process of deciding on the contents of a job in terms of its duties and responsibilities, on the methods to be used in carrying out the task, in terms of techniques, systems and procedures, and on the relationships, that should exist between the job holder and his superior subordinates and colleagues. Job design in this present study is conceptualized based on the Job Characteristics Model (JCM) proposed by Hackman and Oldham (1980). JCM Posit that a job should contain the five job characteristics which include task feedback, job autonomy, skill variety, task identity, task significance and skill variety. Supporting the thought on the relationship between job design and employee engagement Prominent scholars of employee engagement literature has emphasized the role of job design in promoting employee engagement. For instance, Kahn's (1990) theory of engagement originated from Hackman and Oldham's (1980) theory that characteristics of jobs affect an employee's attitudes and behaviors. Kahn (1990) argued that the nature of job design precondition for the extent to which employees would engage with their work. In associate anthropology study, he found that once individuals were doing work that was difficult and varied, they were a lot of probably to be engaged (Truss et al., 2013).

Similarly, Bakker and Demerouti's (2007) job-demands-resources (JDR) model additionally highlights the importance of job design in creating engagement. Predominantly, the model argued that organizational, physical and social facets of a job are related to engagement. This because jobs design can result of the availability of job resources that can buffer excessive work demands, thereby enhancing the achievement of organizational goals, and encouraging personal development and learning (Bakker & Demerouti, 2007). The social exchange theory supports the relationship between job design and employee engagement. According to the social exchange theory, the relationship between an organization and its employee based on the exchange rules (Truss et al., 2013). An organization can only get what it gives, that is to say, when a job is enriched with job autonomy, task feedback skill variety, task significance and task identity, employees will reciprocate in the form of job and organizational engagement. Therefore, our third hypothesis is as follows:

H3. Job design is positively related to employee engagement.

The mediating effect of technostress on job design and employee engagement

In other, for scholars to test for mediating the relationship between independent and dependent variables, it requires three criteria (Alias, Noor, & Hassan 2014). Firstly, there ought to be a direct association between the independent variable and the dependent variable, secondly a directed association between the independent variable and the mediating variable and thirdly a direct association between the mediating variable and the dependent variables (Alias et al., 2014). Drawing from the first criteria, it has been established that job design is positively related to employee engagement, the meta-analysis by Humphrey et al. (2007) and a study by Saks (2006) both found a positive relationship between the five facets of job design, Job autonomy, task feedback, task significance, skill variety and task identity and employee engagement. More recently, the study by Truss et al. (2013) revealed that employees whose jobs offer high levels of task variety, autonomy, task feedback significance are more likely to be highly engaged. Also considering the second criteria, on the relationship between technostress and employee engagement, a study by Alarcon and Lyons (2011) engaged employees generally gain sufficient job resources. Abundant resources can reduce the stress brought by job demands, which is negatively related to job satisfaction. Lastly based on the third criteria, on the relationship between job design and technostress, recent studies by Suh and Lee (2017) revealed that job characteristic jointly induces technostress. Thus, the fourth hypothesis is as follows:

H4. Technostress will mediate the relationship between job design and employee engagement.

Methods

Measures

This study adopted existing validated scales. All items measured on a five-point Likert scales that range from "strongly disagree to agree strongly". The independent variable

in this study is job design (skill variety, task identity, task significance, task feedback and job autonomy) is measured by 15 items adapted from Pee and Lee (2015) as unidimensional. Likewise, the mediating variable technostress was measured by three out of the five dimensions of technostress (techno-overload, techno-complexity and techno-invasion) and measured by 14 items adapted from Tarafdar et al. (2014) as unidimensional. Lastly, the dependent variable employee engagement is measured by 11 items adapted from Saks (2006) measuring job engagement and organizational engagement. All dimension was combined and measured as unidimensional to provide the most significant basis for theory and construct validation test (Smith, McCarthy, & Zapolski, 2009) Likewise, it increases the precision of the understanding of the phenomenon of technostress and its relationship with Job design and employee engagement. Smart PLS 3 is utilized for data analysis because of its ability to measure complex model.

Data collection

The data for this study was collected from 319 front desk employees working in Nigerian commercial banks. we utilized a self-administered questionnaire, and data is collected within the space of 5 months. A total of 400 surveys was distributed only 338 questionnaires was retrieved, and 19 questionnaires are discarded because of the error of omission.

Result and analysis

Data were analyzed using the partial least square (PLS) technique of analysis (Hair, Hult, Ringle, & Sarstedt, 2016) to test the research Model. PLS is a second-generation SEM technique that can be used to estimate loadings of indicators on the constructs and the casualty connections between constructs in a complex model. Accordingly, in comparison with the SEM techniques, PLS can be used to measure small samples (Hair et al., 2016) which is the case in this study.

Measures reliability and validity

Confirmatory Factor analysis (CFA) was used to examine the reliability and validity of the measures adopted from the literature, and the result is in Table 1. To explore the reliability of the measure, we utilized the inter-item consistency reliability of the Cronbach's alpha. The worth ranges from 0.847 to 0.872 which is above the specified threshold 0.7 suggested by Nunnally and Bernstein (1994) and conduct.

Furthermore, convergent validity that demonstrates the extent to which the multiple efforts to measure a related concept ought to be connected and jointly examined. Hair, Sarstedt, Pieper, and Ringle (2012), suggested that composite reliability, factor loading and average variance extracted should be used to test the convergent validity. Composite reliability ranges between 899 to 918 which is within the suggested threshold of 0.7 by Hair et al. (2012). The loading for all the indicator exceeded the suggested value of 0.6. The average variance extracted, that the overall quantity of variation among the indications ranges from 506 to 528 which within the specified threshold value of 0.5 by Hair et al. (2012). Equally, discriminant validity is analyzed by

comparing the squared correlations between constructs and variance extracted constructs. As given in Table two, the square correlation for individual construct is smaller than the average variance extracted by the indicators measuring the construct, that indicates adequate discriminant validity.

Table 1. The result of CFA for measure model

Construct	Item	Internal reliability Cronbach's alpha	Factor loading	Convergent validity composite reliability	Average Variance Extracted
Employee engagement	EE-JOB_5	0.860	0.714	0.891	0.506
	EE-ORG_6		0.643		
	EE-ORG_7		0.763		
	EE-ORG_9		0.798		
	EE-OR_10		0.699		
	EE-OR_11		0.715		
	EE=ORG_8		0.694		
	EE_JOB_3		0.654		
Job design	JD-JA_1	0.872	0.711	0.899	0.528
	JD-JA_2		0.750		
	JD-JA_3		0.687		
	JD-SV_2		0.742		
	JD-SV_3		0.710		
	JD-TI_1		0.788		
	JD-TI_2		0.663		
	JD-TI_3		0.752		
	TS_1	0.847	0.791	0.884	0.522
	TS_3		0.794		
	TS_4		0.659		
	TS_5		0.732		
	TS_6		0.639		
	TS_7		0.754		
	TS_9		0.673		

Note: A Composite reliability = (square of the summation of the factor loadings)/ {(square of the summation of the factor loadings) + (square of the summation of the error variances)} b Composite reliability = (summation of the square of the factor loadings)/ {(summation of the square of the factor loadings) + (summation of the error variances)}

Table 2. Discriminant validity of constructs

	Employee engagement	Job design	Technostress
Employee Engagement	**0.712**		
Job Design	0.725	**0.726**	
Technostress	0.542	0.516	**0.723**

Note: the figures highlighted represents the average variance extracted while the other entries represent the squared correlations.

Table 2 presents the result of the discriminant validity. We utilized the two test for discriminate validity. Firstly, the contrast of the item loadings with items Crosses loading and the comparison of average variance extract. Each item should load higher on its intended construct than on the lower construct (Hair et al., 2016). We found that all our items satisfied this conditions (see table 2 and 1) Secondly, constructs variance extracted or shared variance between the constructs and the items should be higher than the shared variance amongst the construct and other constructs. It was measured by equating the square root of the construct's average variance extracted (AVE) to its connection with other constructs. For each construct, the result established that the square root of the AVE is significantly larger than its correlation with other constructs (see table 1). Thus discriminate validity is established.

PLS Structural Model

Model fit

Having established the discriminant and convergent validity of the constructs, we verified the overall structural model. Generally, our proposed model has a good fit for the data. The result is presented in Table 3.

Table 3. Model fit indices

Fit index	Study	Recommended value	Source
SRMR	0.9	≥ 0.10 or of 0.08	Hu and Bentler (1999)
d_ULS	2.5	≥ 0.05	Henseler, Hubona, and Ray (2016)
d_G1	0.1	> 0.05	Henseler et al. (2016)
d_G2	0.1	> 0.05	Henseler et al. (2016)
Chi-Square	2.294		
NFI	0.6	≥ 0.9	Henseler et al. (2016)

Table 3 showcases the model fit index. There are numerous tests of model fit. When conducting a model fits test, it is essential to define the approximate model. The only

approximate model fits measure by PLS path modeling is that the standard root of mean square residual (SRMR) and NFI The SRMR is represented the dissimilarities between the experiential correlation and the model inferred matrix. SRMR price of under zero.10 or of 0.08 is considered as a good fit (Hu & Bentler, 1999). In this present study, the SRMR value is 0.09 and NFI 0.5. Thus, the model fit has been established.

Structural model results

The overall structural model of the is measured by calculating the extent of variance explained by the independent variable and the altitudes of the strength of its paths and the degree of correspondence of each of our hypothesis to a specific structural model path. We used the R^2 to measure the model exploratory ability. Synonymous with the description of the regression analysis, the variation is anticipated to exceed 10% to qualify for an experimental study. The result confirmed that the independent variable explained above 20% variance. Has specified in table 5, employee engagement R^2= 0.564 and Technostress R^2=0.265 demonstrate that Job design illustrates a substantial sum of the variation in technostress and employee engagement. Thus, this result offers support for H1, H2 and H3 (See table 4).

Table 4. Path coefficient result

	Mean	STDEV	T-Value	P-Value
Job design-> Employee engagement	0.608	044	13,950	0.000
Job design -> Technostress	0.517	046	11,137	0.000
Technostress -> Employee engagement	233	049	4,700	0.000

Table 4 presents the synopsis of the path relationship in the model. The relationship between job design and employee engagement is highly significant, the mean value = 0.608 and t-value =13,950. Thus hypothesis 1 is supported. Additionally, there is a significant relationship between job design and technostress, the mean value is = 0.517 and t-value =11,137, therefore, providing support for hypothesis 2. Lastly, the relationship between technostress and employee engagement is significant, the mean score =233 and t-value= 4,700, hence hypothesis 3 is supported.

Table 5. Indirect effect

	Mean	STDEV	T-value	P-value
Job design-> technostress -> employee engagement	0.120	0.028	4,196	0.000

Table 5 present the result of the indirect effect. The mean score = 120 and the t-value = 4,196, thus mediating effect of technostress on job design and employee engagement is established.

Discussion

The primary objective of the research is to explore the influence of job design (skill variety, task significance, task identity, task feedback and job autonomy) on technostress and the effect of technostress on employee engagement on employees of Nigerian commercial banks. Additionally, the research has explored the relationship between job design and employee engagement. The result of the study is as follows.

Firstly, job design as a significant positive effect on technostress contrary to the negative relationship proposed by the research based on job design and stress literature, instead job design in the case of this current study increases technostress, is an indication that job design does not reduce technostress, rather than poorly designed job can be a source of stress. It is an indication that the nature of job design in the context is not enriched with the core job characteristics. Although job design in this is study is significantly correlated with technostress, and therefore it is capable of mitigating the impact of technostress, however, in the case of excessive level of technostress, job design alone may not be able to minimize the effect of technostress on individuals. Additionally, if other organizational-based antecedents to technostress (i.e. Supervision, management policies, working hours, technological-pace of change, reward, recognition and technological antecedents of technostress has not been resolved. However, the importance of job design in countering the effect of technostress should not be underestimated has previous studies have revealed a negative relationship between job design and workplace stress.

Secondly, the findings of the study revealed that technostress has a significant effect on employee engagement. Based on the employee engagement and workplace stress literature, working under stressful work conditions can lead to a decrease in employee engagement. In another word, a negative relationship is conceptualized between stress and employee engagement. However, the result of this study has revealed a significant positive correlation between technostress and employee engagement. The result is an indication that the consequence of technostress or job stress most not always be negative because job stress could be a motivating element for some individuals. This argument can be supported by Yerkes-Dodson law that maintained that the peak of performance could be attained when individuals experience a modest level of work-related pressure. Accordingly, citing the activation theory, Schmitt, Den Hartog, and Belschak (2016) has argued that there is a curvilinear (inverted U Curve relationship) relationship between time pressure and employee engagement. However, it should be noted that extreme level of stress can decrease employee's motivation and engagement. Equally, the positive relationship between technostress and employee engagement is an indication that banking employees in Nigeria are highly engaged, therefore it can be argued that participants are stressed-engaged or exceedingly engaged to their job and organization. Thus, it can be argued that because banking employees are highly engaged, they can cope with technostress. Employee engagement and stress literature have established that engaged employees always gain sufficient job resources that enable them to overcome job-related stress (Schaufeli & Bakker, 2004).

Thirdly, this study found a positive association between job design and employee engagement. The result is consistent with our hypothesis and also consistent with the

outcome of previous research on employee engagement and job design. Literature has shown that job enriched with the five core job characteristics (Job autonomy, task feedback, task identity, task significance and skill variety) can result in increased employee engagement (Truss et al., 2013).

Practical implication

The first practical implication of this study is that organizations and management should note that despite all the advantages associated to the use of technology in workplaces, technology can induce stress in the lives of employees which can affect employee's engagement. The first practical implication of the present study is the importance of Job design (task feedback, job autonomy task identity, skill variety and task significance in alleviating the impact of technostress on employees, however, the present findings may be of particular interest to practitioners given that we found a positive relationship between job design and technostress. The result shows that job design alone may not be able to mitigate the effect of technostress if the job context is or hygiene factors (e.g. banking policies, pay salary, working hours, supervision, interpersonal relationship) and socio-technological aspects (Task-technological interdependency, system failure and bad IT infrastructure) is unattended. Thus, management and practitioners should always consider the socio-technical (social and technical) aspect of job design.

The second practical implications of this study are that management should make employee engagement one of its top priorities because employee engagement is related to various organizational outcomes. Employee engagement can assist employees to deal with stress brought about by excessive job demand. Even though we proposed a negative relationship between technostress and employee engagement in line with the proposition by stress and engagement literature, our result revealed a positive relationship between technostress and employee engagement contrary to the negative relationship posit by stress and engagement. It shows that the outcomes of technostress may not always be adverse if employees are highly engaged. According to the Yerkes-Dodson law state that the height of performance is attained when people experience a moderate level of work pressure Nevertheless, a low and very high level of time pressure de-motivates workers from work (Schmitt et al., 2016). Likewise, job design is an essential element of ensuring employee engagement. Therefore, management should ensure that jobs are designed based on the five core job characteristics.

Implications for research

This current study has contributed to research on technostress in three significant ways. Firstly, this study explored job design a precursor of technostress by adopting and integrating the five core job characteristics propounded by Hackman and Oldham (1980) as unidimensional measure for job design, dissimilar to Suh and Lee (2017) that has adapted part of the characteristics and has explored its relationship with some technology features instead of technostress. Secondly, this study is first the research that has investigated employee engagement as an outcome of technostress. A unidimensional method was adopted for the measurement of employee engagement to provide a meaningful basis for theory and construct validation since the selected

instrument has been utilized in another context (Smith et al., 2009). Unidimensional has been adopted for both job design and employee engagement to for a clearer understanding of their relationship with technostress. Thirdly, this study contributes to technostress, job design and employee engagement literature contextually, mainly this the first study that has examined the relationship between technostress, job design and employee engagement in the Nigerian commercial banking sector.

Limitations and future research

Notwithstanding the fascinating finding this current study, similar to other research on technostress (Ayyagari et al., 2011; Suh & Lee, 2017; Tarafdar et al., 2015; Yan et al., 2013) this study adopted cross-sectional study methodology. This has constraint the extent of the inferences that can be made on causality and increases concern for common method bias. Accordingly, there is a probability for sample biasness because participants are recruited from individual working in commercial banks. Therefore, the findings may not be generalized across other countries and sectors. Thus future research can repeat this study in another industry or country. Additionally, future studies can also modify the technostress–job deign-employee engagement model, by incorporating other job design model and theory such as the sociotechnical theory of job design and social job characteristics (e.g. feedback from colleagues, a relationship outside the organization, supervision, interpersonal relationship).

Conclusions

This current study has examined the relationship between technostress, job design and employee engagement. The proposition of study, was that job design would have a negative impact on technostress, meaning that job design would reduce the impact of technostress, on the contrary, the result of the study has shown that job design does not reduce technostress. Additionally, we had proposed that technostress would reduce the level of employee engagement, contrarily, the result of the study revealed a positive relationship between technostress and employee engagement. This implies stress does not necessarily reduce employee engagement, but a moderate level of stress can serve as a motivator while a high level of stress may have a negative impact on individuals. Which means it is possible to be stressed and have job engagement. Similarly, the study reveals a positive relationship between job design and employee engagement.

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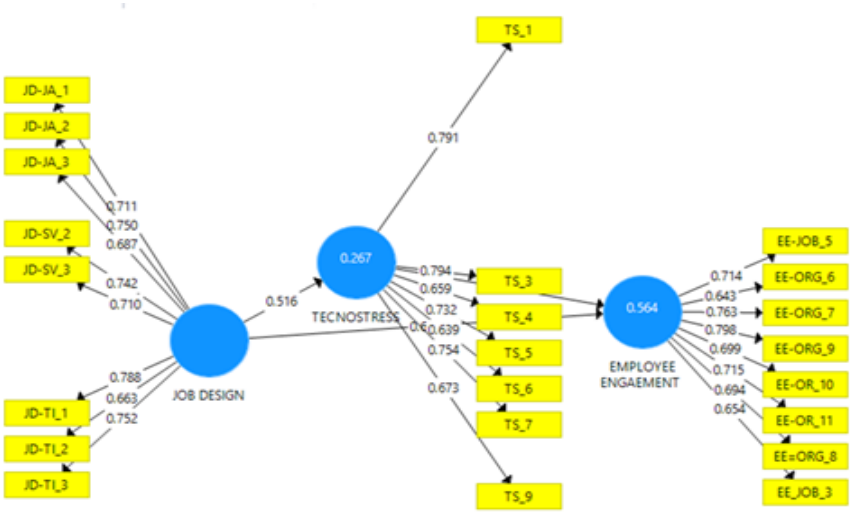
Appendixes



Path Coefficients

Mean, STDEV, T-Values, P-Values | Confidence Intervals | Confidence Intervals Bias Corrected

	Original Sampl...	Sample Mean (	Standard Devia...	T Statistics (|O...	P Values
JOB DESIGN ->...	0.607	0.608	0.044	13.950	0.000
JOB DESIGN ->...	0.516	0.517	0.046	11.137	0.000
TECNOSTRESS ...	0.229	0.233	0.049	4.700	0.000

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