

Work Stress Among Nigerian Electronic Technology Teachers: Exploring its Influence on Job Performance with Stress Beliefs as Moderator

Abidemi O. Shodeinde^{a*}, Theresa C. Ogbuanya^b

^a*Department of Industrial Technical Education*

Tai Solarin University of Education, Ijagun, Nigeria

^b*Faculty of Education, School of Education Studies*

University of the Free State, Bloemfontein, South Africa

**contactabidemi@gmail.com*

Article history

Received

5 July 2023

Received in revised form

4 September 2023

Accepted

29 September 2023

Published online

23 December 2023

Abstract

Electronic technology teachers are among professionals who may face adverse effects of stress due to the nature of their job. This study explores the relationship between work stress and job performance among electronic technology teachers and investigates the role of stress beliefs in moderating this relationship. Purposive sampling was used to select 123 electronic technology teachers and 22 heads of departments in government-owned universities in Nigeria, who provided data for the study. Results indicate that work stress significantly predicts job performance among electronic technology teachers ($\beta = .60, p < .001$). Additionally, stress beliefs were found to be a significant predictor of job performance ($\beta = .61, p < .001$). Furthermore, stress beliefs were found to moderate the relationship between work stress and job performance. The findings suggest that teachers' job performance is influenced by both work stress and stress beliefs. Positive stress beliefs are associated with improved job performance, while negative stress beliefs may lead to decrements in performance. Understanding the interplay between work stress, stress beliefs, and job performance can inform interventions to improve the performance of electronic technology teachers and, subsequently, the skill acquisition of their students.

Keywords: Electronic Technology Teachers; Work Stress; Job Performance; Stress Beliefs

Introduction

Electronic technology teachers belong to the group of professionals that may be adversely affected by stress due to the nature of their job. Stress can result whenever a situation is viewed as threatening, and one's options for handling it are regarded inadequate (Fischer et al., 2016). In addition, Lazarus (2006) defined stress as a relationship between an individual and their environment that is regarded as straining or exceeding their resources and jeopardizing their welfare. Stress at work is referred to as work stress. According to Carr et al. (2011), when the expectations of the workplace do not align with the employee's abilities, resources, and requirements, work stress is the unhealthy reactions that result. In other words, work stress is a harmful undesirable work environment that emanates when the job demands of electronic technology teachers outweigh their capabilities, resources, and needs.

The job demands of electronic technology teachers can be overwhelming. An electronic technology teacher, according to Watford UTC (2015), develops stimulating, enriching, and engaging lessons that encourage and nurture students' interest, enthusiasm,

and skill acquisition while simultaneously responding to all curriculum changes and fostering a positive working relationship with co-workers and students. Similarly, Richmond (2017) stated that electronic technology teachers help students acquire skills by organizing and delivering high-quality instruction and creating course materials. Electronic technology teachers play a crucial role in facilitating requisite skills acquisition for self-reliance and gainful employment of learners. In the process of discharging their duties and meeting the demands of their job, electronic technology teachers often encounter a number of stressors which emanates from various factors such as adjusting to technological shifts and rapid changes in the field of electronics, troubleshooting of faults in complex systems of electronic appliances; sitting for long hours to detect faults; design and construction of circuits; prolonged visual inspection of miniature PCB components; working with fragile electronic components, and many others which may affect their job performance.

Job performance relates to the act of doing a job, such as teaching. Viswesvaran and Ones (2000) refer to job performance as quantifiable actions, behaviors, and results that employees engage in or direct toward

corporate goals. Similarly, Jacobs (2013) viewed job performance as a means to reach a goal or set of goals within a job, role, or organization. In other words, job performance is the behaviour exhibited by the electronic technology teacher, which has an impact on the realization of the goals of electronic technology programmes. These behaviours and actions can be impacted by stress at work.

Work Stress and Job Performance

Perhaps, the greatest consequence of work stress, as it relates to education goals, is seen on workers performance and students' learning outcomes. Different studies have suggested or found an inverse relationship between work stress and performance (Arshadi & Damiri, 2003; Bakker & Demerouti, 2014; Farler & Broady-Preston, 2012; Mohammadi & Keshavarz, 2011; Ogbuanya et al., 2017). Thus, the stress-inducing job demands of electronic technology teachers implies that even the best and brightest among them may not be performing at an optimal level. Teachers work stress does not only affect their performance, it also has consequences for student skill acquisition. In connection with that, researchers have found that teachers' low job performance is an important aspect that affects student learning outcomes negatively (Rivkin et al., 2005) as well as outcomes later in life (Chetty et al., 2014). Therefore, rising unemployment rate among electronic technology graduates in Nigeria (National Bureau of Statistics, 2017), and unskilled services rendered by electronic technology workers (Nungse, 2015), can be attributed to decrement in job performance of electronic technology teachers. Based on the foregoing, we therefore hypothesize that:

Hypothesis 1: Work stress is a significant predictor of job performance of electronic technology teachers.

Stress beliefs in Work stress - Job Performance Relationship

Not all workers facing the same stressful situations at work exhibits decrements in job performance (Keller et al., 2012). Even while many employees may encounter stressful circumstances at work, not all of them will show a decline in work performance. Some employees perform better even when under the same stressor, while others get frazzled and less effective (Boyd, 2017; Lambert, 2005). The reason for this subjective reaction to work stress is unclear. However, an alternate possibility that needs to be researched is that this may be due to individuals' stress beliefs (Kilby & Sherman, 2016). Beliefs, according to Khoyneshad et al. (2012), can help people find meaning in their lives and influence their behavior. Also, Takarangi et al. (2017) discovered that optimistic beliefs had a favorable link with positive attributes that assist people overcome life's challenges.

Stress beliefs, according to Crum et al. (2013), are a set of beliefs about the good and bad aspects of the stress experience that are thought to influence how an individual experiences and responds to stressful events. Beliefs about stress, in particular, determine how information is extracted from difficult events, depending on whether the individual believes stress is debilitating or uplifting (Crum & Lyddy, 2013). Individuals who believe that stress is debilitating tend to focus on negative information from stressors that reinforces their negative beliefs, resulting in actions and behaviors that attempt to avoid anything that tax individual resources (Crum, Akinola, et al., 2017). Individuals who believe that stress is enhancing focus on positive information from stressors that reinforces their beliefs. Additionally, a person's collection of beliefs or way of thinking that influence their behavior and perspective is referred to as the mindset of such individual (Meyer, n.d.). However, according to stress mindset theory, when confronted with stressors, positive stress beliefs lead to positive consequences and vice versa (Crum, Leibowitz, et al., 2017).

Based on the foregoing, positive stress beliefs of electronic technology teachers are expected to lead to improved performance. Based on the foregoing, we therefore hypothesize that:

Hypothesis 2: Stress belief is a significant predictor of job performance of electronic technology teachers.

Hypothesis 3: The effect of work stress on job performance of electronic technology teachers will be moderated by stress beliefs.

Given that the level of skill acquired by electronics technology students is hinged on the degree of electronic technology teacher job performance, teachers cannot be exonerated from the dearth of skills noticeable in electronic technology graduates. At the same time, when thinking of performance improvements initiatives for teachers, the issue of work stress cannot be overlooked, considering its connection to decrements in job performance. As a result, the expanding literature suggesting that an individual's stress beliefs determine the extent to which stress creates negative consequences such as decreased job performance, needs to be examined. Gaining insight into the relationship between electronic technology teachers work stress, stress beliefs, and job performance would provide valuable information that can be used to improve teachers' performance.

A conceptual framework for the variables is provided in Figure 1 below. In the study, we investigated the relationship between three key variables: the independent variable, which is work stress, the dependent variable, which is job performance, and the moderator variable, which pertains to individuals' beliefs about stress.

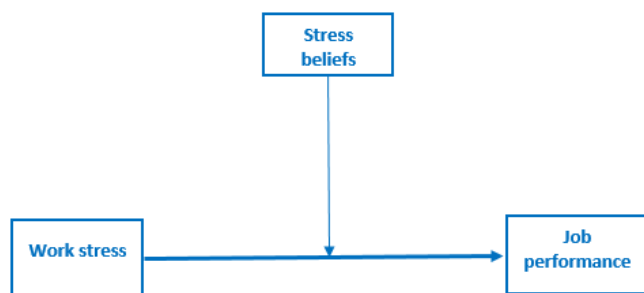


Figure 1: Conceptual Framework

Methods

Participants

The participants of this study were all 123 electronic technology teachers and 22 heads of departments in the 22 government-owned universities that undertake electronic technology education programme in Nigeria. Electronic technology teachers and heads of departments in government-owned universities were purposively sampled.

Measures

Work stress: This is a 20-item scale adapted from the following measures: 4-item 'Assessment of Teacher Stress Questionnaire' (Kyriacou, 2001), 45-item 'Intensity of Stressful Events-at-Work Questionnaire' (Motowidlo et al., 1986), 10-item 'Perceived Stress Scale (Cohen et al., 1983), 5-item 'Job Stress Scale' (Lambert et al., 2006), and 22-item 'Workplace Stressor Assessment Questionnaire' (Mahmood et al., 2010). The Work stress scale assessed the degree to which electronic technology teachers consider their job conditions as stressful. Participants rated the extent to which their work conditions have been stressful, from 5 (*Not at all stressful*) to 1 (*Extremely stressful*), with lower scores indicating greater work stress.

Stress beliefs: This is a 23-item scale based on the 'Stress Beliefs Scale' (Laferton et al., 2018). On a 5-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), participants reported their thoughts about stress. Higher scores represented positive stress beliefs, whereas lower scores represented negative stress beliefs.

Job performance: To determine electronic technology teacher job performance, average of both supervisor/peer ratings and self-rating by the teacher were employed. Self-report measures of teachers' job performance in the past three months contain a 37-item scale which was adapted from the 47-item 'Individual Work Performance Questionnaire' (Koopmans et al., 2012). All items were on a 5-points

rating scale. Rating scale labels were adapted to the specific items as follows: Items 1 and 2 was rated from (*insufficient*) to (*very good*), items 3 and 4 was rated from (*much worse*) to (*much better*), items 5 and 6 was rated from (*not at all*) to (*a great deal*), while items 7-37 were rated from (*seldom*) to (*always*). To measure supervisors' assessment of the teachers' job performance in the past three months, the wordings of the teacher self-report measures were modified for use as the supervisor-rating instrument to measure teacher performance. The scale for assessing job performance of electronic technology teachers by supervisors was administered only to the heads of departments. For both self-report and administrator rating of job performance instrument, a high score indicates a high job performance.

Data Analysis

Frequency counts, percentages, means, standard deviations, correlational analyses, regression analyses, and moderation analysis were used to analyze the data. Statistical Package for Social Science (SPSS 22.0) was used to perform frequency counts, percentages mean, standard deviation, bivariate correlations, and regression analysis, while PROCESS Macro (Version 2.16.1) was used for the test of moderation. The decision rule for establishing correlation analyses was based on strength of correlation coefficients (r) ranging between ± 0.00 to 0.19 for very weak relationship; ± 0.20 to 0.39 for weak relationship; ± 0.40 to 0.59 for moderate relationship; ± 0.60 to 0.79 for strong relationship; and ± 0.80 to 1.00 for very strong relationship (Evans, 1996).

To take a decision on regression analyses, if the p -value of the regression estimate (β) or F -value is less than or equal to 0.05 , the regression estimate or F -value is significant (then reject the null hypothesis). To take a decision on moderation, when the ΔR^2 increases (i.e. positive), the variable added in-between predictor and outcome variable is a possible moderator, but if ΔR^2 is zero or negative, such variable is not a possible moderator. Additionally, if zero does not lay in-between the lower limit and upper limit of confidence intervals, then the moderation effect is significant.

Results

Profile of respondents: Description of respondents based on gender, stress beliefs, work stress, and job performance indicated that more male respondents were involved in the study (93%). Majority of the electronic technology teachers are facing a high amount of work stress (54%), and about half of the teachers are not exhibiting professional standards of job performance (51%). Also, negative stress beliefs are common among the teachers (80%).

Table 1. Mean, Standard Deviation, Cronbach's alpha, and Correlation among the Scales.

Variables	Mean	SD	1	2	3
Work Stress	3.59	0.91	(.871)		
Job Performance	3.64	1.06	.596**	(.890)	
Stress Beliefs	3.19	0.99	.409*	.609**	(.824)

Note. Cronbach's alpha values are in the diagonal. *p < .05, **p < .01.

We determined the mean and standard deviation, Cronbach's alpha, and correlation analysis for this study. The results presented in Table 1 shows that Cronbach's alpha values for the study variables are relatively large. In this study, the alpha values for work stress, job performance, and stress beliefs are .871, .890, and .824 respectively, which imply high measure of internal consistency. A closer look at Table 1 reveals that the correlations among the constructs are relatively moderate and significant.

Hypothesis 1: Work stress is a significant predictor of job performance of electronic technology teachers.

As shown in Table 2, a simple linear regression was calculated to predict the job performance of electronic technology teachers based on the amount of stress they

experience at work. $\beta = .60$, $t = 8.17$, $p < .001$. A significant regression was found ($F(1, 121) = 66.67$, $p < .001$, with a regression square (R^2) of .335 and an adjusted regression square (R^2) of .350. The adjusted R^2 value means that about 35% of the variance in the dependent variable (job performance of electronic technology lecturers) is explained by or can be predicted by the independent variable (work stress). Because of this, Hypothesis 1 is therefore accepted.

Hypothesis 2: Stress belief is a significant predictor of job performance of electronic technology teachers.

As shown in Table 3, a simple linear regression was calculated to predict the job performance of electronic technology teachers based on the belief they hold about stress. $\beta = .61$, $t = 8.45$, $p < .001$. A significant regression was found ($F(1, 121) = 71.16$, $p < .001$, with a regression square (R^2) of .370 and an adjusted regression square (R^2) of .365. The adjusted R^2 value means that about 36% of the variance in the dependent variable (job performance of electronic technology lecturers) is explained by or can be predicted by the independent variable (stress beliefs). Because of this, Hypothesis 2 is therefore accepted.

Hypothesis 3: The effect of work stress on job performance of electronic technology teachers will be moderated by stress beliefs.

Table 2. Regression Analysis Summary for Work Stress Predicting Job Performance

Variable	B	SEB	β	T	df	F	P	R ²	Adjusted R ²
Work Stress	.690	.085	.596	8.165	1,121	66.67	.000 ^b	.335	.350
Constant	1.151	.313							

a. Dependent Variable: job performance

Table 3. Regression Analysis Summary for Stress Beliefs Predicting Job Performance

Variable	B	SEB	β	T	df	F	P	R ²	Adjusted R ²
Stress Beliefs	.649	.077	.609	8.436	1, 121	71.16	.000 ^b	.370	.365
Constant	1.555	.257							

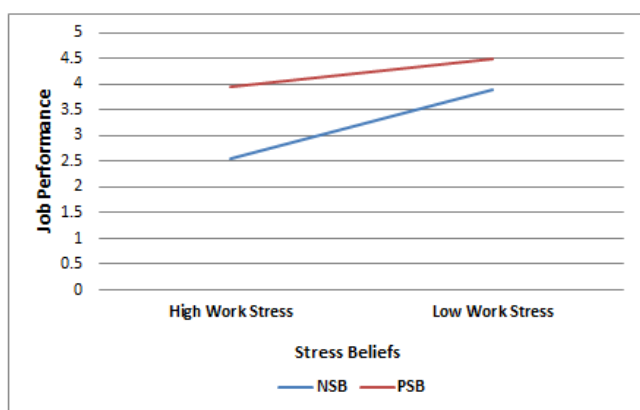
a. Dependent Variable: job performance

Table 4. Overview of the Impact of work stress on job performance under the influence of stress beliefs

Outcome: Job Performance					
	β	SE	T	LLCI	ULCI
Interactions					
Work Stress X Stress Beliefs	-.2310	.0866	-2.67	-.4024	-.0596

The data shown in Table 4 reveals the moderating effects of stress beliefs on the relationship between work stress and job performance. The table shows significant interaction effects of work stress and stress beliefs on job performance ($\beta = -.231$, $SE = .0866$, $LL = -.4024$, $UL = -.0596$). Thus, Hypothesis 3 is accepted. This means that stress beliefs significantly moderate the relationship between work stress and job performance of electronic technology teachers. Since the moderation is significant, a graph was produced from the data for visualizing the conditional effect of work stress (x) on job performance (y).

Figure 1 below therefore depicts the direction of the moderating role of stress beliefs on the relationship between work stress and job performance. The figure shows the impact of work stress on job performance under the influence of stress beliefs. As shown in the output of the graph generated on the conditional effect of x on y, electronic technology teachers who hold positive stress beliefs generally perform better on their job. However, the figure depicts a wide boost in performance for teachers working under high conditions of work stress.



NSB: Negative stress beliefs; PSB: Positive stress beliefs

Figure 1. Impact of work stress on job performance under the influence of stress beliefs

Discussion

The specific purpose of this research is to investigate the relationship between work stress, stress beliefs, and job performance. With respect to hypothesis 1, our findings showed that work stress significantly predicts job performance of electronic technology teachers. The direction of relationship is such that job performance reduces as work stress increases. This finding validates the job demand-resource theory which suggested an inverse relationship between work stress and job performance. The finding is also in agreement with that of Atkinson (2004) and Mohammadi & Keshavarz (2011), who have linked work stress to decrements in job performance.

Findings on hypothesis 2 established that stress beliefs significantly predict job performance of electronic technology teachers. Specifically, 36% of the

variance in their job performance can be predicted by a factor of whether they hold a stress-is-debilitating or stress-is-enhancing mindset. The direction of relationship is such that negative stress beliefs lead to decrements in job performance. This suggests that teachers who have positive stress beliefs are likely to maintain professional standards of job performance. This finding is in agreement with that of Aronson et al. (2002) and Blackwell et al. (2007) who noted that mindsets can significantly influence health and performance.

Furthermore, findings on hypothesis 3 revealed that stress beliefs significantly moderate the relationship between work stress and job performance of electronic technology teachers. The direction of the moderating role of stress beliefs on the relationship is such that under conditions of high work stress electronic technology teachers who hold negative stress beliefs are the ones who experience decrements in job performance. This means that the earlier finding that job performance reduces as work stress increases (Hypothesis 1) is only true for electronic technology teachers who believe that stress is harmful for them. This finding means that teachers who experience a lot of stress but do not believe that stress is harmful are no more likely to show decrements in job performance. This implies that the real obstacle to productivity of electronic technology teachers is not their stress-inducing job conditions, but the negative belief they have about stress. Keller et al. (2012) noted that when an individual under stressful situation views the experience as enhancing, his body is going to believe him, and his stress response will become healthier. In support of the findings, Keller et al. (2012) further noted that the mindset that one holds with respect to stress can alter and influence the effect of stress, thereby making the expected more likely. In other words, stress mindset becomes a self-fulfilling prophecy. Thus, the degree to which stress produces negative outcomes such as decrements in job performance depends largely on electronic technology teacher stress beliefs.

Implication of the Study

The central finding of this study is that degree to which work stress leads to decrements in job performance in electronic technology teachers, depends largely on electronic technology teachers stress beliefs. Ordinarily, one may find it difficult to accept that the belief that one holds about stress has implications on one's job performance. However, the findings of this study when made available to teachers via anticipated publication will reveal the important role they play in determining the nature of their stress experience. This is because findings showed that in spite of stressful work conditions, teachers who hold positive stress beliefs still demonstrate positive outcomes. Through this information, teachers may be motivated to change their stress beliefs in order to

replicate the same outcome in their own lives. Teachers will thereby tap into the positive side of stress to jump-start their adrenalin and motivate performance more quickly in response to impending deadlines, while having things under control. When teachers imbibe positive stress beliefs and thereby exhibit professional standards of job performance, it will contribute to their advancement and promotion on the job.

Because the information generated from this study have the potential of making teachers function at their best, it also has implication for the learners. Since teachers play a crucial role in facilitating skill acquisition for self-reliance and gainful employment of learners, when they function at an optimal level, this translates to high quality instruction and interaction between teacher and students. This provides better opportunity for skill acquisition and progress of learners.

The findings of this study also serve as an eye-opener to educational managers on the stress-inducing nature of electronic work and the need not to overlook the issue of work stress in their teacher performance improvement efforts. This will spur them to take appropriate actions, such as creating opportunities for professional development, provision of state-of-the-art equipment, and other measures to support and create an enabling work environment for electronic technology teachers. Since, the study revealed that teachers who hold positive stress beliefs do not experience decrements in job performance. This may lead to the design of intervention measures and packages for conducting intervention programmes, geared towards changing teachers stress beliefs, as part of measures to improve their performance.

Conclusion

This study shed light on the relationship between work stress, stress beliefs, and job performance among electronic technology teachers. The findings provide valuable insights into the challenges faced by these educators and how their beliefs about stress play a pivotal role in determining their job performance. Firstly, the study established that work stress significantly predicts job performance among electronic technology teachers. This emphasizes the importance of addressing work-related stressors to enhance teacher performance. Furthermore, the study revealed that stress beliefs moderate the relationship between work stress and job performance. In other words, the impact of work stress on job performance is influenced by an individual's stress beliefs. These findings carry several implications for educators, educational managers, and policymakers. Teachers may benefit from interventions aimed at changing their stress beliefs, promoting a more positive outlook on stress, and equipping them to handle stress more effectively. Educational institutions and managers should also consider strategies to reduce workplace

stressors, thereby supporting teachers in maintaining high job performance. Ultimately, the study highlights the role of stress beliefs in shaping the experiences and job performance of electronic technology teachers. Understanding and addressing these beliefs can lead to improved teacher performance, which, in turn, has the potential to positively impact the skill acquisition of students in Nigeria. This research contributes to the broader conversation on teacher well-being and performance in the education sector.

Limitations of the Study

Our study is not without limitations, First, the study population is distinct, and of relatively small size. So, caution should be exercised in generalizing the findings of the survey to other fields of study. Second, this study employed a cross-sectional survey design, which does not ultimately allow causal inference to be made. We, therefore, recommend that longitudinal or experimental research be conducted in future research for improved and better results. Finally, there is no doubt that individuals may not be better assessors of their strengths and weaknesses; hence there may be relatively and unintentional insincere responses by the respondents of this study.

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