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Work engagement and burnout of academics at South African higher education institutions: A job demands and resources perspective

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Orientation: The transformation of the academic landscape, exacerbated by COVID-19, creates an urgent need to understand escalating demands on academics and how resources could help overcome these challenges.

Research purpose: This study tested a structural model examining how job demands and resources directly and indirectly influence employee outcomes through burnout and work engagement in South African higher education institutions.

Motivation for the study: While evidence links work engagement, burnout, and job demands–resources (JD-R) across workplaces, these relationships remain under-explored in South African academia, particularly during COVID-19.

Research approach/design and method: Using a quantitative design, respondents (N = 309) from several South African universities completed six instruments assessing burnout, work engagement, job resources (autonomy, meaningful work, organisational support) and job demands (workload, online teaching, work-home interaction and publication pressure). Structural equation modelling evaluated model fit and tested hypothesised relationships.

Main findings: High job demands significantly increased burnout, while job resources promoted engagement and reduced burnout. Results highlight the need for institutional strategies to alleviate excessive demands while reinforcing key resources.

Practical/managerial implications: Institutions should develop targeted interventions enhancing job resources, clarifying roles, and creating supportive environments, especially during organisational change.

Contribution/value-add: This study advances understanding of burnout and engagement in South African higher education, challenging simplistic JD-R model applications and contributing to theoretical development and practical interventions tailored to South African academics.

Keywords: Job Demands–Resources model; academic burnout; work engagement; higher education; South African academics; structural equation modelling.

Introduction

The landscape of academia has transformed dramatically in recent years, precipitating profound implications for the well-being of academic staff (Gadermann et al., 2023). This growing concern has garnered increasing attention from both researchers and policymakers seeking to understand the complexity and implications of the transformation (Mudrak et al., 2018). The confluence of several factors, including massification (Nyagope, 2024; Teichler, 2017; Tight 2021), intensifying internationalisation, heightened emphasis on practical applications of academic work, and the expanding influence of university management structures (Eds. Bentley et al., 2013) has contributed significantly to rising levels of burnout and disengagement among academic personnel (Rocha et al., 2020; Theron, 2022).

Academic staff are now being confronted by escalating workloads that negatively impact their well-being and performance (Higher Education South Africa [HESA], 2011; Pillay, 2020). This deterioration in the academic work environment has systematically eroded academics' autonomy while substantially increasing their responsibilities (Dlamini & Dlamini, 2024; Kinman & Wray, 2024). The situation is particularly acute in sub-Saharan African universities, which operate in

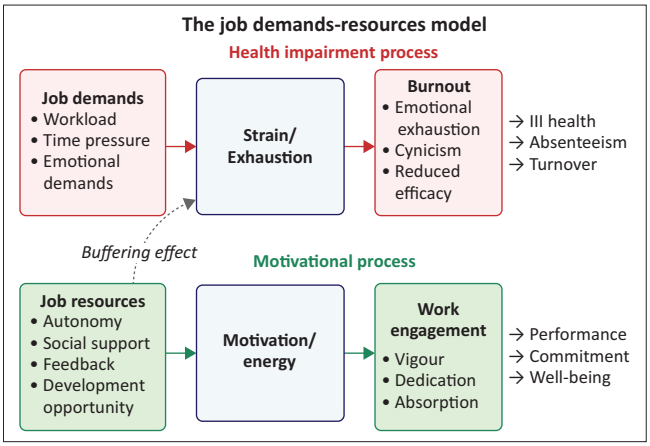
chronically under-resourced environments. When combined with constant organisational flux, these conditions significantly compromise the overall well-being of academic employees (Hammoudi Halat et al., 2023; Nicholls et al., 2022).

These expansions present formidable challenges for academic staff who must not only fulfil an increasing number of roles but also do so while facing severe resource constraints (Abebe & Assemie, 2023; Nicholls et al., 2022). Academics are tasked with accomplishing increasingly complex responsibilities within demanding environments (Wray & Kinman, 2021). The coronavirus disease 2019 (COVID-19) pandemic fundamentally reshaped teaching and research activities, accelerating the pre-existing challenges facing academic staff (Al-Taweel et al., 2020). The pandemic necessitated a rapid transition to virtual learning environments, affecting academics regardless of their previous experience with online education (Hodges et al., 2020). While the acute phase of the pandemic has passed, its lasting effects continue to influence academic work through sustained changes in teaching modalities, heightened expectations for flexibility, and ongoing financial constraints (Watermeyer et al., 2021). Financial pressures stemming from the pandemic raised concerns about potential staff reductions or institutional mergers (DePietro, 2020), intensifying workloads and elevating levels of anxiety, stress, and ultimately burnout among academic staff – patterns that persist in the post-pandemic academic environment (Gewin, 2021; Jensen & Olsen, 2023).

The execution of these multifaceted academic responsibilities without adequate job resources inevitably leads to strain (Kinman, 2024), potentially resulting in burnout (Graizi et al., 2021), diminished physical well-being (Mudrak et al., 2018), mental health deterioration (Ghasemi et al., 2021; Heiden et al., 2021), and reduced organisational commitment (Dube & Ndofirepi, 2024; Mwesigwa et al., 2020). Despite these prevalent challenges, many academics maintain a remarkable level of engagement with their work, deriving significant intrinsic motivation and personal identity from their professional roles (Han et al., 2020). However, this strong identification with academic work can be a double-edged sword: while it may foster engagement and resilience, an overreliance on work-based identity can also increase vulnerability to burnout and undermine work–life balance (Kinman & Johnson, 2019; Watts & Robertson, 2011), particularly when job demands exceed available resources.

Literature review

The Job Demands–Resources (JD-R) model (Demerouti et al., 2001; Mazzetti et al., 2023) offers valuable insights into the relationship between job characteristics and employee well-being in contemporary work environments (Schaufeli & Taris, 2014). This framework identifies two distinct categories of job characteristics – job demands and job resources – and



Source: Demerouti, E., Bakker, A.B, Nachreiner, F., & Schaufeli, W.B. (2001). The job demands resources model of burnout. *Journal of Applied Psychology, 86*, 499–512. https://doi.org/10.1037/0021-9010.86.3.499

Note: Job resources can buffer the negative impact of job demands on strain (dotted line).

FIGURE 1: The job demands–resources model: Dual processes of health impairment and motivation.

proposes two processes that predict employee well-being (Figure 1). The first process involves health impairment leading to burnout, while the second constitutes a motivational process culminating in work engagement. The JD-R model has been extensively utilised as a conceptual framework to facilitate empirical studies across diverse occupational settings globally, including nursing, dentistry, home care, and call centres (Emami, 2020; Fernando et al., 2020).

Furthermore, research within the theoretical framework of the JD-R model (Bakker & Demerouti, 2008) has increasingly focused on psychological strain and well-being factors, thereby elucidating the multifaceted characteristics of the academic work environment, which influence burnout and work engagement. These characteristics encompass a range of job demands – including excessive workload, time pressure for research output and publications, administrative burden, emotional labour in student interactions, and role ambiguity – as well as job resources such as autonomy in teaching and research, collegial support, opportunities for professional development, recognition for achievements, and access to adequate research infrastructure and funding (Mudrak et al., 2018; Pujol-Cols & Lazzaro-Salazar, 2018).

Burnout and job demands

Although academia was historically considered a low-stress environment, characterised by tenure security, intellectual autonomy, flexible working hours, and the romanticised image of the contemplative scholar pursuing knowledge at a leisurely pace (Altbach, 2015), this perception no longer reflects reality (Teoh & Kee, 2020). The traditional model of academic work, rooted in notions of collegiality and academic freedom with relatively light teaching loads and minimal administrative responsibilities, has been fundamentally transformed since the late 20th century through marketisation, managerialism, and performance-based accountability systems (Deem et al., 2007). Research interest in academic staff burnout has

gained significant momentum since the 2000s (O'Connor & O'Hagan, 2016). Currently, burnout is conceptualised as a prolonged response to chronic emotional and interpersonal stressors in the workplace (Maslach et al., 2001). According to Demerouti et al. (2001), burnout occurs when job demands are high and job resources are limited. The COVID-19 pandemic has intensified the focus on burnout in academia, as universities were compelled to rapidly transition from face-to-face instruction to online delivery models (Capone et al., 2020), resulting in additional work demands and consequent burnout for academics (Daumiller et al., 2021).

Work intensity, defined as the level of effort, speed, and concentration required to complete work tasks within available time, often characterised by high work pace, tight deadlines, simultaneous competing demands (Green, 2004), and extended working hours, has been identified as definitive adverse determinants of work-life balance among academic employees (Hogan et al., 2014; Naidoo-Chetty & Du Plessis, 2021). During the pandemic, these factors significantly disrupted the personal lives of all educational institution stakeholders (Bulińska-Stangrecka et al., 2021). Even before the pandemic, elevated levels of strain attributable to time pressure, workload, inadequate remuneration, job insecurity, and diminished role clarity (Poalses & Bezuidenhout, 2018) were highlighted as having deleterious effects on academics. These findings corroborate studies that correlate occupational stress with burnout syndrome among academic staff (Nazari et al., 2016; Rocha et al., 2020).

Work engagement and resources

Organisations generally strive to maintain an engaged workforce (Bakker & Albrecht, 2018). For higher education institutions (HEIs) to achieve their teaching and research objectives, sustaining a motivated academic workforce is crucial (Dubbelt et al., 2016). Work engagement represents a motivational mental state accompanied by work-related actions (Aboramadan et al., 2020; Bakker & Albrecht, 2018). Theoretically, work engagement signifies a condition in which employees commit their cognitive, emotional, and physical efforts for the benefit of their work (Kahn, 1990). Under the assumptions of the JD-R model, job resources drive a motivational process, as they possess the potential to predict high work engagement, low cynicism, and excellent performance (Bakker & Demerouti, 2007).

Accordingly, Han et al. (2020) indicate that certain resources – such as social support from colleagues, administrative support, and teaching resources – must be present for work engagement to occur. Resources that mitigate the negative effects of daily demands are functional in achieving goals and fostering personal growth and development (Bakker & Demerouti, 2017; Schaufeli & Taris, 2014). This influence leads to a gain spiral in which a reciprocal causal relationship among resources increases motivation, well-being, and work engagement (Hobfoll, 2001; Hobfoll et al., 2018). Consequently, high levels of personal resources cultivate significant work engagement, potentially protecting employees from burnout exposure (Maricutoiu et al., 2017). Job resources can fulfil either an intrinsic motivational role by promoting employees' personal growth and learning or an extrinsic motivational role by facilitating the achievement of work goals (Demerouti et al., 2001). Therefore, a motivated and committed employee has the power to revitalise, re-energise, and transform organisations – precisely what is needed to navigate crises, handle complexity, and manage change effectively (Whitsed et al., 2025). Evidence from numerous studies suggests that job resources have a direct negative relationship with burnout (Bakker et al., 2005).

While numerous studies report on the JD-R model and its effect on employee well-being (e.g. Field & Buitendach, 2011), limited research focuses on the ever-increasing demands and their negative consequences for South African academics. Additionally, it is vital to highlight the role that resources could play in assisting academics to overcome these demands.

Understanding these job demands and the potential role of resources can have lasting effects and help organisations support their employees. When an organisation fails to provide essential job resources, employees may withdraw and disengage, potentially leading to burnout (Takawira et al., 2014; Whitsed et al., 2025).

Goal of the study

This study addresses the central research question: how do job demands and resources affect burnout and work engagement among academics in South African HEIs? This investigation is particularly important given the changing nature of academic work in South Africa, where increasing demands coupled with limited resources create a challenging work environment.

According to Naidoo-Chetty and Du Plessis (2021), several specific demands have been identified as negatively affecting academics in the South African context. These include quantitative demands (publication pressure, excessive workload and competing time demands), qualitative demands (balancing work and home responsibilities, complexity of student support, organisational politics and a lack of mental health support for academic staff) and organisational demands (using Technology-Mediated Learning Approaches and lack of Structural Resources). Furthermore, potential resources assist academics when dealing with an overabundance of demands, such as organisational resources (social resources) and personal resources (autonomy and meaningfulness of work).

Our primary aim is to test a structural model examining two key relationships: firstly, how specific job demands (work overload, online teaching and learning, work-home interaction, and publication pressure) directly and indirectly affect burnout; and secondly, how job resources (autonomy and meaningful work) influence work engagement among South African academics. Through structural equation modelling,

this study examines both the direct pathways between variables and the more complex mediating and moderating relationships hypothesised in our model (see Figure 2).

Specifically, this study was designed to address the following hypotheses regarding academics employed in South African HEIs:

- **H1:** There is a statistically significant relationship between job demands and burnout.
- **H2:** Resources moderate the relationship between job demands and burnout.
- **H3:** There is a statistically significant relationship between job resources and work engagement.
- **H4:** Burnout mediates the relationship between job demands and work engagement.
- **H5:** Exhaustion and/or burnout explains a significant proportion of variance in work engagement.

The findings have important implications for HEIs seeking to support academic staff well-being and productivity during times of increasing pressure and change. When an organisation fails to provide essential job resources, employees may withdraw and disengage, potentially leading to burnout (Takawira et al., 2014). Thus, understanding these job demands and the potential role of resources can have lasting effects and help organisations better support their academic employees.

Research design

Sampling and participants

A quantitative, online survey design was utilised to attain the research objectives. For the present study, the population consisted of academic employees from seven South African HEIs (n = 309). The final sample consisted of 295 (n) after cases were removed with more than 80% missing values.

As indicated in Table 1, the sample consisted of a majority of female academics (62%), with men accounting for 36.6%. Professors and associate professors made up approximately 24% of the sample. The majority were lecturers (39.5%), with senior lecturers accounting for 18.4%. The majority of the participants have been working for their current institution for more than 10 years (40.8%). In terms of age, the largest group of respondents were between the ages of 36 years and 45 years old, accounting for 26.5% of the sample. Thus, the typical respondent in the sample is employed at the lecturer and senior lecturer level, with more than 10 years of tenure with their current employer and has more than 21 years of work experience.

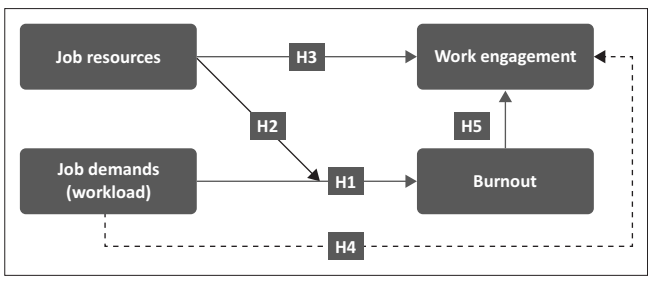


FIGURE 2: Theoretical model of the relationships among the variables.

Measuring instruments

This study employed seven validated instruments to measure the variables of interest. Table 2 provides an overview of each instrument, including the variables measured, example items, and response formats.

Job resources

Two dimensions from the Flourishing-at-Work Scale Short Form (FAWS-SF; Rautenbach & Rothmann, 2017) were used to measure job resources:

TABLE 1: Biographical and demographic profile of respondents (N = 295).

Characteristic	Frequency (n)	%
Gender		
Men	182	61.60
Women	108	36.60
Other	2	0.67
Prefer not to answer	3	1.00
Age (years)		
18–25	8	2.70
26–35	72	24.40
36–45	82	27.70
46–55	66	22.40
56+	67	22.70
Job title		
Lecturer	122	41.30
Senior lecturer	57	19.30
Professor	40	13.50
Associate professor	37	12.50
Other	39	13.20
Tenure at current institution (years)		
< 1	10	3.30
1–2	42	14.20
3–5	49	16.60
5–7	27	9.10
8–10	41	13.80
> 10	126	42.70
Full-time work experience (years)		
1–2	23	7.70
3–5	26	8.80
6–10	48	16.20
11–20	77	26.10
21+	121	41.00
Province of institution		
Western Cape	86	29.10
Eastern Cape	130	44.00
Free State	68	23.00
Mpumalanga	11	3.70

TABLE 2: Internal consistency for each of the job demand scales.

Scale name	Cronbach's alpha	Range of item–Total correlations	Problematic items*
Workload	0.79	0.45–0.58	None
Work-home interaction	0.92	0.30–0.81	None
Online teaching and learning	0.76	0.30–0.73	R_OTL1
Publication pressure	0.77	-0.25–0.60	PP11

*, Problematic items are flagged when they lead to an increase in overall Cronbach's alpha if deleted or if the item–total correlations is lower than 0.20.

Autonomy assessed participants' perceived freedom in performing their work tasks. A typical item is 'I feel free to do my job the way I think it could best be done'. Previous studies have reported strong reliability coefficients for this subscale: Rautenbach and Rothmann (2017): $\alpha = 0.81$, Rothmann (2014): $\alpha = 0.77–0.89$, and Van Zyl et al. (2019): $\alpha = 0.84$.

Meaningful work measured the perceived value and significance of participants' work. Example items include 'My work is meaningful' and 'I feel that my work makes a difference in people's lives'. Previous studies have reported reliability coefficients for this subscale: Rautenbach and Rothmann (2017): $\alpha = 0.93$, Rothmann et al. (2019): $\alpha = 0.89$, and Van Zyl et al. (2021): $\alpha \approx 0.85–0.92$. Both dimensions were measured on a six-point scale ranging from 1 (never) to 6 (every day).

Perceived Organisational Support was measured with the Survey of Perceived Organisational Support (Eisenberger et al., 1986). The survey was used to measure employees' beliefs about their organisation's commitment to their well-being, using a seven-point scale (1 = strongly disagree, 7 = strongly agree). An example item is 'My organisation really cares about my well-being'. The internal consistency reliability for this measure was previously reported as $\alpha = 0.75$ (Eisenberger et al., 2002).

Job demands

Four instruments were used to measure job demands:

Workload was assessed by using Dhanpat et al.'s (2019) scale, measuring time pressure and work volume on a seven-point response scale (1 = strongly disagree to 7 = strongly agree). An example item is 'I work under time pressure'. The scale has demonstrated strong internal consistency, ranging between 0.76 and 0.82 (Dhanpat et al., 2019).

Online teaching and learning was measured by using Dhanpat et al.'s (2019) questionnaire, evaluating technology-mediated learning approaches on a seven-point scale (1 = strongly disagree to 7 = strongly agree). A typical item is 'The drive towards online teaching and learning in my department is progressing well'. Dhanpat et al. (2019) reported a Cronbach's alpha of $\alpha = 0.71$ for this scale.

Work-home interaction was measured by using an adapted version of the Survey Work-Home Interaction (SWING; Geurts et al., 1995), focusing on negative work-home interference on a four-point scale (0 = Never, 1 = Sometimes, 2 = Often, 3 = Always). A sample item is 'You find it difficult to fulfil your domestic obligations because you are constantly thinking about your work'. In South African studies, the Cronbach's alpha for Negative Work-Home Interaction has varied from 0.85 to 0.90 (Pieterse & Mostert, 2005).

Publication pressure was assessed by using two subscales from Haven et al.'s (2019) Publication Pressure Questionnaire (PPQr), rated on a five-point scale (1 = Totally disagree, 5 = Totally agree). The Publication Stress subscale ($\alpha = 0.80$) includes items such as 'I feel forced to spend time on my publications outside office hours'. The Publication Attitude subscale ($\alpha = 0.78$) includes items such as 'Publication pressure harms science'.

Work engagement

Work engagement was measured by using the work engagement dimension from the FAWS-SF (Rautenbach & Rothmann, 2017). This measurement evaluates participants' psychological presence in their role, comprising physical (vigour), cognitive (absorption), and emotional (dedication) components. A typical item is 'I am enthusiastic about my job'. Previous studies have reported reliability coefficients for this subscale: Rautenbach and Rothmann (2017): $\alpha = 0.85$, Rothmann et al. (2019): $\alpha = 0.88$, and Van Zyl and Rothmann (Eds. 2019): $\alpha = 0.86–0.90$. The scale used a six-point response format ranging from 1 (never) to 6 (every day).

Burnout

The Oldenburg Burnout Inventory (OLBI; Demerouti et al., 2003) was used to measure burnout through two dimensions: disengagement and exhaustion. Responses were rated on a 5-point scale from 1 (strongly disagree) to 5 (strongly agree). An example item from the disengagement scale is 'I always find new and interesting aspects in my work', while a typical exhaustion item is 'There are days when I feel tired before I arrive at work'. A high score on this survey would therefore be indicative of higher levels of disengagement and exhaustion. The OLBI has demonstrated good internal consistency for its subscales: exhaustion ($\alpha \approx 0.74–0.87$) and disengagement ($\alpha \approx 0.73–0.85$) (Demerouti et al., 2003; Reis et al., 2015). The OLBI was selected for its conceptual alignment with the JD-R model.

In the present study, all scales demonstrated acceptable reliability with Cronbach's alpha coefficients exceeding the 0.70 threshold (Nunnally & Bernstein, 1994).

Data analysis procedure

The data analysis process consisted of three broad phases. During the first phase, the data were screened for outliers, typos, and missing values. During this phase, the descriptives (central tendency and dispersion) were assessed. This activity was performed in part to assess whether the data were appropriate for the chosen research techniques (e.g. reliability, factor analyses, and Structural Equation Modelling). In the second phase, the data measures were subjected to correlations and factor analyses to assess the internal structure of the measures before including them in the structural model.

In order to evaluate the confirmatory factor analysis (CFA) models, MPLUS 6 (Muthén & Muthén, 2009) was utilised. The goodness-of-fit statistics as well as model parameters were evaluated to determine the construct validity of the

measures. The fits of the models were assessed with the Satorra-Bentler Chi-square (χ^2), the root-mean-square error of approximation (RMSEA), the comparative fit index (CFI) and the Tucker-Lewis Index (TLI). Following Hu and Bentler's (1999) guidelines, we deemed that values of 0.90 for the CFI and TLI were acceptable, whereas values of 0.95 or higher were considered indicative of excellent fit. For the RMSEA values, up to 0.08 represented reasonable errors of approximation (Browne & Crudeck, 1993).

Reliability analysis using Cronbach's alpha (α) was also performed to determine whether the newly structured measurement instruments would produce consistent results with continued application. The final analysis phase attempted to conceptualise and test the proposed structural model, including the direct, indirect, and moderating effects.

Substantive hypotheses were empirically corroborated when the direction, magnitude, and statistical significance of path coefficients were congruent with a-priori theorising. Ideally, standardised factor loading estimates should be at least 0.50, but optimally 0.70 or higher. However, standardised loading estimates of 0.30 are still acceptable as an absolute minimum normative boundary, according to Hair et al. (2014).

Ethical considerations

Ethical clearance to conduct this study was obtained from the University of the Western Cape Humanities and Social Science Research Ethics Committee (No. HS19/6/11). This study adhered to rigorous ethical standards throughout the research process. During the selection of measurement instruments, the researchers carefully evaluated questionnaires to ensure that they were free from potential bias and appropriate for the South African academic context. The research design incorporated several key ethical safeguards.

Formal ethical clearance was obtained from the host institution prior to commencing the study, and explicit permission was secured from all participating HEIs. Informed consent was embedded within the research design, ensuring that participants made autonomous decisions regarding their involvement. All potential participants received a comprehensive information sheet detailing the study's aims, methods, and potential implications.

Participation was entirely voluntary, and academics were explicitly informed of their right to withdraw from the research at any point without consequence. To protect participant privacy and confidentiality, we administered the questionnaire via an anonymous online link, with only minimal biographical information collected for analytical purposes. This approach ensured that responses could not be traced to specific individuals. Data storage protocols adhered to institutional guidelines, with all electronic data secured by using password protection and restricting access to the research team.

The researchers maintained transparency throughout the research process and have committed to making the aggregated findings available to participating institutions while ensuring that individual responses remain confidential.

Results

Reliability of the scales

Job resources

The Job Resources Scale reported an internal consistency reliability of 0.919. Most of the items reported strong item–total correlations, but there was one problematic item that would result in an increase in Cronbach's alpha if deleted (autonomy).

Job demands

In the current study, job demands were made up of workload, work-home interaction, online teaching and learning demands, and publication demands. As each of the factors is unidimensional, we report the internal consistency for each of the scales independently. Table 2 summarises the results for the four factors.

The internal consistencies of the scales were good, all being higher than 0.70, but there were some problematic items in the Online Teaching and Learning factor (R_OTL1) as well as in Publication Pressure (PP11).

Reliability of the burnout scale

The Burnout scale was broken down into two dimensions, namely the Disengagement and Exhaustion Scale. The overall Cronbach's alpha was 0.858. However, when considering the disengagement dimension, there was a Cronbach's alpha of 0.725, and with the exhaustion dimension, an alpha of 0.827. Most of the items reported strong item–total correlations, with the exception of item 13 (0.0726).

Reliability of the work engagement scale

Although the work engagement scale consisted only of three items, it reported satisfactory internal reliability at 0.759, and all the items contributed to the internal consistency.

Validity and reliability of the measurement models

Both confirmatory and exploratory factor analyses were conducted on the individual measures to make sure that they demonstrate a basic level of construct validity. The results of the structural model will remain ambiguous if the integrity of the measurement models is not established initially (Kline, 2011). In the process of investigating the construct validity of the individual measures making up the structural model, the authors considered the model fit indices, model parameters, and residuals.

CFA: Job demands

In an effort to test the internal structure and construct validity of the four factors that make up the job demands, we fitted a CFA model to each of the Job Demands separately.

From Table 3, one can see that only the Workload Scale demonstrated an acceptable model fit to the data (CFI = 0.090; TLI = 0.944; CFI = 0.916; SRMR = 0.045). The work-home interaction scale reported poor fit, and a large number of items had to be deleted from the scale to achieve a mediocre-fitting model. Publication pressure failed to terminate into an admissible solution, which suggests that the scale cannot be used because of a lack of internal validity. Finally, online teaching and learning did not report a good fit (CFI = 0.197; TLI = 0.709; CFI = 0.419; SRMR = 0.087), but most of the items reported strong factor loadings (except item 1). As a result, only the workload dimension of job demands was used for further analysis.

CFA: Job resources

The results of the CFA analyses on the Job Resources scale are presented in Table 4.

The original CFA model suggested poor model fit with multiple items with poor standardised factor loadings. The RMSEA value of 0.233 was within the acceptable range; however, the CFI (0.735) and TLI (0.669) statistics were below acceptable thresholds in the literature. After deleting items POS_8, Aut_1, MW_1, and MW_2, the fit improved to RMSEA of 0.201, CFI (0.927), TLI (0.890), and SRMR of 0.039. Although these model fit results are not good, we felt that deleting any more items from the scale would compromise the content validity of the scale.

CFA: Burnout

In the following section, the CFA results of the Burnout Scale are discussed. A summary of the fit statistics and the standardised factor loadings is reported in Table 5.

The results suggest that the items fit the data relatively well. The RMSEA value of 0.090 was within the acceptable range; however, the CFI (0.813) and TLI (0.782) statistics were below acceptable thresholds in the literature. A revised measurement model was fitted to the data, and we deleted item 13 to see whether the model fit would improve, but there was no meaningful increase in model fit when the item was deleted. Thus, it was decided to retain item 13 in the CFA model.

Finally, we did not fit a CFA model to the work engagement scale, because the scale contained only three items, which would result in a just-identified model with a perfect fit. As a result of the perfect-fitting model, it would be impractical to estimate a CFA model to check the scale's measurement integrity. In the next section, we will focus on the SEM and aim to answer the research questions.

Moderation and mediation results

The SEM model was specified to test the theoretical model depicted in Figure 2. The theoretical model consists of several direct, indirect (mediation), and moderated relationships. It was decided to test two nested models because it is relatively complex to test mediation and moderation in the same model because of different estimation techniques. The first model contained the main effect and mediation effect but no interaction effects. The second model contained interaction effects only and no mediation effects.

Before estimating the SEM model, we examined the distribution of scores to test for normality, homoscedasticity of residuals, and linearity. These are key assumptions of the SEM model, which need to be tested prior to specifying the

TABLE 3: CFA analyses on job demands.

Scale	Model fit	Range of standardised factor loadings	Problematic items*
Workload	RMSEA = 0.09 CFI = 0.94 TLI = 0.92 SRMR = 0.04	0.52–0.78	-
Work-home interaction	RMSEA = 0.13 CFI = 0.50 TLI = 0.33 SRMR = 0.10	0.13–1.01	Item 7 (0.23) Item 8 (0.27) Item 11 (1.01) Item 9 (0.33) Item 15 (0.13)
Online teaching and learning	RMSEA = 0.20 CFI = 0.71 TLI = 0.42 SRMR = 0.09	0.18–0.86	Item 1 (0.18)
Publication pressure	The model did not converge to an admissible solution	-	-

RMSEA, root-mean-square error of approximation; CFI, comparative fit index; TLI, Tucker-Lewis index; SRMR, standardised root mean square residual.

*, Problematic items are flagged when they report low standardised factor loadings, cross-loadings based on modification indices, and high residual values. Standardised factor loadings are reported in brackets.

TABLE 4: CFA analyses on the job resources scale.

Scale	Model fit	Range of standardised factor loadings	Problematic items*
Job resources	RMSEA = 0.20 CFI = 0.93 TLI = 0.89 SRMR = 0.04	0.115–0.968	POS_6 (0.240) POS_7 (0.115) POS_8 (0.012) Aut_1 (0.139) MW_1 (0.191) MW_2 (0.192)

RMSEA, root-mean-square error of approximation; CFI, comparative fit index; TLI, Tucker-Lewis index; SRMR, standardised root mean square residual.

*, Problematic items are flagged when they report low standardised factor loadings, cross-loadings based on modification indices, and high residual values. Standardised factor loadings are reported in brackets.

TABLE 5: CFA results of the burnout scale.

Scale	Model fit	Range of standardised factor loadings	Problematic items*
Burnout	RMSEA = 0.09 CFI = 0.81 TLI = 0.78 SRMR = 0.07	0.03–0.76	Item 13 (0.030)

RMSEA, root-mean-square error of approximation; CFI, comparative fit index; TLI, Tucker-Lewis index; SRMR, standardised root mean square residual.

*, Problematic items are flagged when they report low standardised factor loadings, cross-loadings based on modification indices, and high residual values. Standardised factor loadings are reported in brackets.

model. Because the data did not follow a multivariate normal distribution, it was decided to specify robust maximum likelihood estimation because it has proven to lead to lower levels of parameter bias when using data that do not have a multivariate normal distribution (Yuan & Bentler, 2000).

The correlations among factors, including standard deviation and mean values, are reported in Table 6. The Cronbach's alpha values are reported on the diagonal for ease of reference.

Directional relationships can be observed between factors. The next section will explore these relationships in greater detail, where the SEM model without interaction effects is discussed.

SEM model 1: Main effects and mediation model

In the first SEM model, three main effects (Hypotheses 1, 3, and 5) and one mediation effect (Hypothesis 4) are specified. The fit for the model was mediocre (RMSEA: 0.119; CFI: 0.862; TLI: 0.851; SRMR: 0.102), and subsequently, results should be interpreted with caution. Having said that, we find that most of the standardised factor loadings of the measurement models reported strong associations with the underlying latent factors (Burnout: 0.307–0.727; Workload: 0.547–0.761; Work Engagement: 0.364–0.727; Job Resources: 0.108–0.976). All the factor loadings were also statistically significant.

The standardised path coefficients are depicted in Figure 3:

When looking at the outputs, the following relationships were found to be statistically meaningful ($p < 0.05$). The relationship between Job Demands and Burnout was found to be statistically significant ($\beta = -0.47$, $p < 0.05$). Hypothesis 1 is supported.

The relationship between Job Resources and Work Engagement ($\beta = 0.06$, $p < 0.05$) was statistically significant. Although the effect size is small, the relationship was congruent with the original theorising. Thus, support was found for Hypothesis 3.

Hypothesis 4 predicted a mediating effect of burnout between Job Demands and Work Engagement. Support was found for the mediated relationship ($\beta = -0.31$, $p < 0.05$).

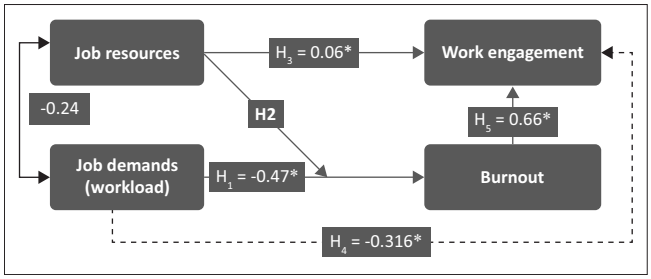
Hypothesis 5 specified the relationship between Burnout and Work Engagement. A strong and statistically significant relationship was found between these two variables ($\beta = 0.66$, $p < 0.05$). Thus, support was found for Hypothesis 5.

In Model 2, we tested the main effects model with interaction effects but without mediation. Despite multiple attempts, including the use of different starting values, the model failed to converge to an admissible solution after 1000 iterations. This non-convergence indicates that the proposed interaction model does not adequately fit the data. Consequently, no support was found for Hypothesis 2, which proposed that job resources would moderate the relationship between job demands and burnout.

TABLE 6: Correlations among factors, standard deviation, and reliability statistics ($n = 295$).

Variable	M	SD	1	2	3	4
1. Burnout	3.01	0.63	(0.86)	-	-	-
2. Work engagement	4.23	1.09	0.60**	(0.76)	-	-
3. Job demands (workload)	63.30	18.63	-0.51**	-0.21**	(0.76)	-
4. Job resources	4.09	1.35	0.67**	0.56**	-0.34**	(0.92)

Note: Reliability statistics are indicated in brackets in the diagonal.
M, mean; SD, standard deviation.
**, $p < 0.001$. Significant at the 0.01 level.



*, statistically significant factor loading at $p < 0.05$.

FIGURE 3: Standardised path coefficients.

Discussion

This study sought to address the central research question: How do job demands (workload, online teaching and learning, work-home interaction, and publication pressure) and job resources (autonomy and meaningful work) affect burnout and work engagement among academics in South African HEIs? Guided by the Job Demands–Resources (JD-R) model, we tested a structural model examining both direct relationships and more complex pathways between these variables. Our findings provide several important insights into how the unique demands placed on South African academics influence their psychological well-being, particularly in the context of increased pressures following the COVID-19 pandemic and ongoing transformations in the higher education sector.

The findings presented below could serve as valuable guidelines for senior management within HEIs during the development of retention strategies to increase employee work engagement and mitigate burnout.

Interpreting the measurement model and theoretical implications

The analysis revealed several significant directional relationships between the key factors under investigation. While some findings aligned with theoretical expectations, others presented intriguing departures from established literature, which warrant further investigation.

The relationship between job demands and burnout (Hypothesis 1).

The significant relationship between job demands and burnout (Hypothesis 1) finding aligns with the core tenets of the JD-R model, which posits that excessive job demands lead to burnout, especially when job resources are insufficient (Bakker & Demerouti, 2017; Demerouti et al., 2001). The model also reflects the particularly complex job-demands landscape within South African higher education. Previous research with South African academics has similarly demonstrated that high job demands, coupled with a lack of sufficient job resources, significantly contribute to burnout (Rothmann & Jordaan, 2006). More recent South African studies (e.g. De Beer et al., 2012; Mostert, 2021) reinforce this relationship across various academic settings, suggesting consistency over time. Meta-analyses and cross-national studies confirm that workload, emotional strain, and cognitive overload are among the strongest predictors of burnout across occupations (Lesener et al., 2019; Taris et al., 2005). The relatively strong relationship observed in this study (β = −0.47) may be amplified by the unique systemic pressures characterising South African universities –such as underfunding relative to rising enrolments (Boughey & McKenna, 2021), high student-to-staff ratios, cultural and linguistic diversity, institutional restructuring post-apartheid, and broader socio-economic inequalities (Pillay, 2019). This finding extends the JD-R model by highlighting how these contextual stressors in developing higher education systems intensify traditional academic job demands, thereby strengthening the link to burnout:

H3: Relationship between job resources and work engagement

This significant finding supports the motivational pathway of the JD-R model, which posits that job resources promote work engagement by satisfying basic psychological needs and enabling goal accomplishment (Bakker & Demerouti, 2017). However, the effect size observed in our study was smaller than those typically reported in international literature. For instance, Halbesleben's (2010) meta-analysis reported moderate correlations between job resources and engagement (ρ = 0.27–0.35), while Schaufeli and Bakker (2004) found a stronger association (β = 0.51) in a Dutch sample.

Our results more closely resemble findings from South African research, in which Botha and Mostert (2018) observed smaller effect sizes (β = 0.09–0.19), suggesting a pattern of more modest resource-engagement relationships within the local academic context. These differences may be attributed to unique contextual factors within South African higher education, including persistent funding challenges, multicultural complexities, student activism, and the pressures of ongoing transformation and curriculum reform (Boughey & McKenna, 2021; Pillay, 2019). These systemic issues may constrain the capacity of job resources to fully activate the motivational processes proposed by the JD-R model. As such, while the theoretical framework remains valid, its practical manifestation appears to be shaped by structural and cultural dynamics specific to the South African university environment:

H4: Mediating role of burnout

Support was found for the mediated relationship between job demands and work engagement through burnout (β = −0.31, $p < 0.05$). Our findings (β = −0.31) extend the work of Asiwe et al. (2014) by demonstrating how the burnout construct they validated functions within the broader JD-R framework in South African workplaces.

Furthermore, our results provide robust support for the JD-R model's dual-process assumption, while simultaneously offering new insights into the complexity of these relationships. Where Bakker and Demerouti (2017) proposed distinct health impairment and motivational processes, our findings suggest these processes are more interwoven than previously theorised. The significant mediating effect of burnout indicates that the impact of job demands on engagement is not merely a parallel process but rather an integrated mechanism in which burnout plays a crucial intervening role:

H5: Relationship between burnout and work engagement

This significant finding contributes to the ongoing theoretical debate regarding the relationship between burnout and work engagement. The strong relationship observed (β = 0.66) supports perspectives that view these constructs as closely related phenomena rather than entirely independent states (Bakker & Demerouti, 2017). This effect size is consistent with previous research suggesting that burnout and work engagement represent opposite ends of a well-being continuum, in which high levels of burnout are associated with correspondingly low levels of engagement (Schaufeli & Bakker, 2004).

Within the South African higher education context, this robust relationship may be particularly pronounced, given the intense pressures facing academics in resource-constrained environments (Eds. Cloete et al., 2015). The magnitude of this relationship suggests that the demanding conditions characteristic of South African universities – including heavy teaching loads, research pressures amid limited funding, administrative burdens, and transformation imperatives – create circumstances in which academics experience either high engagement when adequately supported or significant burnout when overwhelmed. This polarisation may be more extreme in contexts in which job demands are consistently high and job resources are scarce, leading to clearer distinctions between engaged and burned-out academic staff.

The strength of this relationship (β = 0.66) also suggests that interventions targeting either burnout reduction or engagement enhancement may have reciprocal benefits, given the substantial shared variance between these constructs in the South African academic context (Leiter & Bakker, 2010; Schaufeli, 2017):

H2: Moderating role of job resources

The proposed interaction model examining job resources as a moderator between job demands and burnout failed to converge to an admissible solution despite multiple attempts. This non-convergence indicates a fundamental mismatch

between the proposed model and the actual data patterns. When a model fails to converge in this manner, it typically suggests that the hypothesised relationships do not adequately reflect the empirical reality.

Many studies in occupational psychology have found significant interaction effects between job demands and resources within the JD-R framework (Bakker & Demerouti, 2007, 2017; Hu et al., 2017). The fact that our study could not even test the interaction suggests either: (1) the specific data might have unique characteristics that do not fit the typical pattern, (2) there might be measurement or sampling issues, or (3) the relationship might be more complex than a simple interaction in the South African higher education context.

Practical implications for higher education institutions

From a practical perspective, these findings have significant implications for HEIs in South Africa. The complex nature of the demand-burnout relationship suggests that institutions need to move beyond simple, one-size-fits-all interventions. The key is to recognise that addressing burnout in higher education requires creating dynamic, responsive, and empathetic institutional ecosystems that support academic professionals' holistic development and well-being (Kinman & Wray, 2021).

By embracing such a comprehensive approach, HEIs can not only mitigate burnout risks but also enhance overall institutional performance, employee satisfaction, and ultimately, educational quality (Ohadomere & Ogamba, 2021). These findings also suggest that organisations should pay particular attention to the interaction between different types of demands and various organisational contexts, aligning with the work by Bakker et al. (2014) on contextual factors in burnout development.

It is imperative for senior management at HEIs to understand the vital role that burnout and work engagement play in the workplace. Attention should be directed towards investing in the holistic promotion of employee engagement by applying organisational interventions that emphasise increasing job resources. Examples include orientation and coaching programmes for novice academics, which can help clarify role expectations and build necessary skills.

The engagement of academic employees is largely dependent on an understanding of what is expected of them at work (Rothmann, 2015). Unfortunately, academic employees do not always obtain information that is essential for adequate well-being and task performance. Therefore, top management in HEIs should offer assessments and evaluate employees through performance feedback systems based on up-to-date job descriptions.

Specific interventions that could enhance job resources and improve engagement include career conversations, large group meetings, job redesign, job-related training, employee empowerment, career development, interaction with co-workers, and job crafting (Bakker et al., 2014; Mather & Bam, 2015; Rothmann, 2014, 2015). For example, implementing job crafting training teaches employees how to proactively alter their own work environment and is considered a valuable tool for coping with organisational strain and other work pressures (Wrzesniewski, 2012). By concentrating on such interventions, work engagement could be improved, potentially increasing individual performance in the long term.

Limitations and suggestions for future research

While this study provides valuable insights, several limitations should be acknowledged. Firstly, the data were based on a convenience sample rather than probability sampling, potentially limiting representativeness. Secondly, the cross-sectional nature of the data constrains our ability to make causal inferences about the relationships observed. Future research would benefit from longitudinal designs that can better capture the temporal dynamics of the demand-burnout-engagement relationships in academic settings.

The study was conducted on a limited number of HEIs in South Africa as a result of accessibility and convenience. Including a broader range of universities in future research would enhance generalisability. Furthermore, the relatively small sample size necessitates a cautious interpretation of the results. It is possible that academics from different disciplines within HEIs could experience job demands and resources differently, suggesting the value of discipline-specific analyses in future work.

Lastly, only a limited number of resources and demands were measured in this study. Future studies should engage in longitudinal investigations to determine the lasting effects of various job demands and resources on burnout and work engagement across different types of HEIs. Such research could provide a more nuanced understanding of how these relationships evolve over time and across contexts.

Conclusion

This study contributes to our understanding of the complex relationships among job demands, resources, burnout, and work engagement in South African HEIs. While some findings align with established theoretical frameworks, others challenge conventional wisdom and highlight the need for context-specific models of workplace well-being.

The results emphasise the importance of considering both direct and indirect pathways when examining the impact of workplace characteristics on employee outcomes. The unexpected negative relationship between job demands and burnout, and the positive relationship between burnout and engagement, suggest that traditional conceptualisations may not fully capture the complexity of

academic work experiences in South African higher education.

These findings underscore the need for nuanced, context-sensitive approaches to promoting academic staff well-being and engagement. By recognising the complex interplay among demands, resources, burnout, and engagement, HEIs can develop more effective strategies to support their academic staff while enhancing institutional performance and educational quality.

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Competing interests

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CRediT authorship contribution

Mineshree Naidoo-Chetty: Conceptualisation, Investigation, Methodology, Project administration, Writing – original draft, Writing – review & editing. Marieta du Plessis: Conceptualisation, Supervision, Writing – review & editing. Jurgen Becker: Formal analysis, Software. All authors reviewed the article, contributed to the discussion of results, approved the final version for submission and publication, and take responsibility for the integrity of its findings.

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Data availability

The data that support the findings of this study are available from the author, Mineshree Naidoo-Chetty, upon reasonable request.

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