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The role of self-efficacy and psychological resilience in overcoming occupational stress and enhancing work engagement: a comprehensive structural model in Arab academia

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Background: Grounded in Bandura's Social Cognitive Theory and Job Demands-Resources Model, the current study investigates the interaction between self-efficacy and psychological resilience in countering work-related stress and enhancing work engagement amongst teaching staff at Arab universities.

Methodology: Data collection used a cross-sectional sample of 266 scholars from 7 Arab universities. In this research, an advanced Partial Least Squares Structural Equation Modeling technique was used to examine the complex interrelations between self-efficacy, psychological resilience, occupational stress, and work engagement.

Results: The model accounted for 39% variance in work engagement ($R^2 = 0.39$). Self-efficacy directly impacted work engagement, whereas both direct and indirect effects were found in the case of psychological resilience upon this construct. Occupational stress acted as partial mediator in the path between psychological resilience and work engagement. There also existed significant gender differences within the model path specifically in the interaction between self-efficacy and work engagement and between psychological resilience and work engagement and the related mediating and moderating roles played by occupational stress.

Conclusion: Psychological resilience and self-efficacy are key personal resources for academics, but their effects are context-dependent. Therefore, gender differences must be taken into account when designing interventions for the promotion of these resources in academic settings.

KEYWORDS

occupational stress, psychological resilience, self-efficacy, Partial Least Squares Structural Equation Modeling, work engagement

Introduction

University faculty members across the Arab world are increasingly facing complex challenges in higher education environments due to the growing demands of teaching, research, and community service—requirements that often surpass the institutional resources available (Goger, 2025; Kinman and Jones, 2008). These conditions have raised significant concerns regarding the professional and psychological well-being of academics, given their association with burnout and diminished job satisfaction (Watts and Robertson, 2011).

Recent evidence indicates a marked increase in academic stress levels within Arab universities. In Saudi Arabia, for example, 72% of faculty members report experiencing professional burnout (Asfahani, 2024). Data from Qatar University reveal that 46.7% of male and 52.1% of female faculty members show depressive symptoms, while anxiety and high stress rates reach 38.8 and 34.5%, respectively (Hammoudi Halat et al., 2024). Similarly, a study conducted in Egypt found that 70% of academics experience high burnout levels in at least one of the three traditional dimensions (Amer et al., 2022).

In light of these findings, self-efficacy and psychological resilience emerge as critical personal resources that can support professional adaptation in high-pressure academic settings (Bakker and Demerouti, 2008). Self-efficacy reflects an individual's belief in their capability to manage challenging demands (Bandura, 1997, 2001), while psychological resilience denotes one's ability to adapt positively following adversity (Luthar et al., 2000). These resources empower individuals to regulate their behavior effectively and sustain motivation, thereby promoting continued effort and professional commitment. Such a perspective supports the development of an integrative model that combines these personal resources with occupational stress and work engagement within the context of Arab universities.

Although recent literature has demonstrated the beneficial role of self-efficacy and resilience in enhancing work engagement and mitigating occupational stress across various sectors—including healthcare, industry, and general education (Bawazier et al., 2025; Cabrera-Aguilar et al., 2023; Hassan et al., 2024; Ojo et al., 2021; Thai et al., 2024)—research investigating these relationships within Arab higher education remains limited. This gap is particularly evident in studies exploring gender differences within a unified theoretical framework.

Research gap

This study seeks to address the existing gap by constructing a comprehensive structural model grounded in Bandura's Social Cognitive Theory (SCT) and the Job Demands–Resources (JD-R) Model. Despite its prominence in international scholarship, the application of the JD-R framework remains limited within the Arab academic context. Published reviews indicate that most Arab research output continues to focus on conventional educational topics, while systematic implementation of the JD-R model in higher education research is largely absent.

Moreover, the few studies that have adopted the model in Arab settings often examined only direct relationships among variables, overlooking the dynamic mechanisms integral to the framework—such as mediating and moderating processes that explain how demands, resources, and outcomes interact. These studies frequently

neglect to explore gender effects or interactive paths within their structural designs. Such limitations highlight the need for analytically advanced research models that capture the complexity and specificity of Arab academic environments.

Research objectives

- To explain the relationships among self-efficacy, psychological resilience, occupational stress, and work engagement.
- To identify direct and mediated pathways among these variables within Arab university contexts.
- To determine the protective effects of resilience and self-efficacy in mitigating occupational stress.
- To examine gender-based differences in the structural patterns of these relationships.
- To provide evidence-based recommendations that enhance faculty well-being and work engagement in Arab higher educational institutions.

Research contributions

Develops an integrated structural model through Partial Least Squares Structural Equation Modeling (PLS-SEM) within the Arab educational setting to test direct, indirect, and interactive pathways.

- Relies on primary data collected from faculty members across three Arab countries, representing diverse cultural and organizational contexts.
- Employs an advanced multi-group analysis (MGA) to explore gender-based differences in the structural model.
- Integrates both motivational and strain perspectives to advance understanding of academic stress dynamics in Arab universities.

Theoretical framework

Social cognitive theory

Bandura's theory (Bandura, 1986, 1997, 2001) posits that human behavior results from a triadic reciprocal interaction among cognitive, behavioral, and environmental factors, a process known as reciprocal determinism. At the core of this theory lies self-efficacy, which reflects individuals' belief in their capacity to regulate their actions and manage challenges effectively. This belief system serves as a foundation for understanding motivational patterns and engagement behaviors in complex academic environments (Schunk and DiBenedetto, 2020).

Job demands–resources (JD-R) model

According to the JD-R framework, occupational well-being depends on maintaining a balance between taxing job demands and available supportive resources (Bakker and Demerouti, 2017). High demands typically trigger exhaustion through the strain pathway, whereas abundant resources—such as institutional support, self-efficacy, and psychological resilience—activate the motivational pathway, leading

to greater work engagement and job satisfaction (Bakker and Bal, 2010; Salanova et al 2010).

Key constructs

Self-efficacy

Self-efficacy represents an individual's perception of their competence in fulfilling job-related tasks effectively. In academic settings, it manifests as confidence in handling teaching, research, and administrative responsibilities. Empirical studies consistently demonstrate that self-efficacy enhances work engagement while reducing perceived stress levels (Chen W. et al., 2025; Hassan et al., 2024; Wang et al., 2025). Self-efficacy has also been shown to enhance work engagement among physical education teachers through job satisfaction pathways (Zhou et al., 2025).

Psychological resilience

Psychological resilience refers to the individual's ability to adapt positively and recover from adverse experiences (Luthar et al., 2000). Evidence has shown its positive association with performance and engagement, and its negative relationship with burnout (Gu and Day, 2007; Thai et al., 2024; Hassanie et al., 2025). It also functions as a mediator or moderator in the relationship between stress and positive outcomes (Chen W. et al., 2025; Kumar Pradhan et al., 2021).

Occupational stress

Occupational stress encompasses the cumulative demands associated with teaching loads, research obligations, and administrative duties. When such demands exceed individual capacities, performance tends to decline. However, personal resources—particularly self-efficacy and resilience—may buffer these adverse effects, consistent with the JD-R model's assumptions (Bakker and Demerouti, 2017).

Work engagement

Work engagement is characterized by vigor, dedication, and absorption in one's professional activities (Schaufeli et al., 2002). Research highlights that higher engagement levels contribute to improved teaching quality and research productivity in academic contexts (Bakker and Bal, 2010).

Empirical literature review

Recent research underscores personal resources' role in mitigating occupational demands while fostering work engagement across high-pressure professions. Table 1 synthesizes empirical evidence supporting the proposed relationships among self-efficacy, psychological resilience, occupational stress, and work engagement, predominantly from healthcare and educational contexts closely aligned with Arab university faculty experiences.

Findings from prior studies reveal that the majority of empirical models have been conducted in nursing, industrial, and general education contexts, while applications within Arab higher education remain rare. Thus, Arab academic environments require context-specific explanatory models employing Partial Least Squares Structural Equation Modeling (PLS-SEM) to examine these relationships within culturally distinct frameworks.

Arab cultural context

The values of patience, moderation, and self-regulation rooted in Islamic tradition parallel the psychological constructs of resilience and self-efficacy in modern psychology (Kasim and Abdul Majid, 2020; Pramesti and Furqan, 2025). Recent studies suggest that integrating spiritual and cultural dimensions into psychological models enhances professional adaptation and well-being in university settings (Çiçek et al., 2025).

Conceptual framework and development research hypotheses

The conceptual model integrates Social Cognitive Theory (SCT) and the Job Demands–Resources (JD-R) Model, conceptualizing self-efficacy and resilience as personal resources that drive work engagement, while occupational stress functions as a job demand that may hinder it. Based on this framework, the study formulates the following hypotheses:

Direct hypotheses (H1–H5)

H1: Self-efficacy positively predicts work engagement.

Social cognitive theory positions self-efficacy as a motivational mechanism enabling task persistence (Bandura, 1997). Meta-analytic evidence confirms this pathway across professions (Hassan et al., 2024; Hassanie et al., 2025; Table 1).

H2: Psychological resilience positively predicts work engagement.

Resilience facilitates recovery from job demands, sustaining motivational processes central to engagement (Bakker and Demerouti, 2017). This relationship holds across Arab educational contexts (Alsharairi et al., 2025; Table 1).

H3: Self-efficacy negatively predicts occupational stress.

Self-efficacious individuals reframe demands as challenges, reducing perceived stress (Bandura, 1997; Cabrera-Aguilar et al., 2023; Table 1).

H4: Psychological resilience negatively predicts occupational stress.

Resilience buffers chronic occupational demands through adaptive coping (Alqahtani et al., 2025; Table 1).

H5: Occupational stress negatively predicts work engagement.

Excessive demands deplete resources essential for engagement (Al-Fuqaha et al., 2025; Table 1).

Mediating hypotheses (H6–H7)

H6: Occupational stress mediates the relationship between psychological resilience and work engagement (Chen M. et al., 2025; Table 1).

TABLE 1 Summary of major previous studies.

| Authors | Context | Sample | Variables | Main findings | Related hypotheses |
|-------------------------------|------------------|----------------------|--|--|--------------------|
| Bawazier et al. (2025) | Healthcare | 99 nurses | Self-efficacy, resilience | Positive reciprocal relationship | H1, H2 |
| Alsharairi et al. (2025) | Higher education | 589 Faculty member | Resilience, Stress | Resilience buffers stress in Arab context | H2, H4 |
| Al-Fuqaha et al. (2025) | Healthcare | 143 nurses | Work-engagement, Job Satisfaction, Job Performance | Work engagement amplifies job satisfaction's effect on performance frequency | H9 |
| Chen M. et al. (2025) | Healthcare | 412 Nurses | Resilience, workplace violence, engagement | Resilience mediates violence effects | H6 |
| Meng and Zhang (2023) | Healthcare | 356 nurses | Resilience, engagement | Strong positive association | H2 |
| Cabrera-Aguilar et al. (2023) | Healthcare | 459 nurses | Resilience, self-efficacy, stress, engagement | Self-efficacy reduces stress and enhances engagement | H1, H6, H7 |
| Thai et al. (2024) | Occupational | 255 employees | Support, self-efficacy, resilience | Self-efficacy and support enhance resilience | H1, H2, H4 |
| Ojo et al. (2021) | Occupational | 259 employees | Self-efficacy, resilience | Psychological resources reduce stress | H1, H2 |
| Kumar Pradhan et al. (2021) | Industry | Managers | Self-efficacy, resilience, well-being | Resilience moderates the relationship | H8 |
| Hassan et al. (2024) | Higher education | 224 faculty members | Self-efficacy, engagement | Self-efficacy increases engagement | H1 |
| Ngui and Lay (2017) | Education | 200 trainee teachers | Self-efficacy, resilience, stress | Classroom management mediates the relationship | H3, H4 |

H7: Occupational stress mediates the relationship between self-efficacy and work engagement (Cabrera-Aguilar et al., 2023; Table 1).

Moderating hypotheses (H8–H9)

H8: Structural paths vary by gender (Dal Pizzol et al., 2025; Table 1).

H9: Occupational stress moderates the self-efficacy–work engagement relationship among female faculty members (Chen W. et al., 2025; Table 1).

Figure 1 presents the integrated conceptual model synthesizing these hypotheses within the Job Demands-Resources framework augmented by social cognitive theory, providing a comprehensive roadmap for the PLS-SEM analysis that follows.

Methodology

Study design

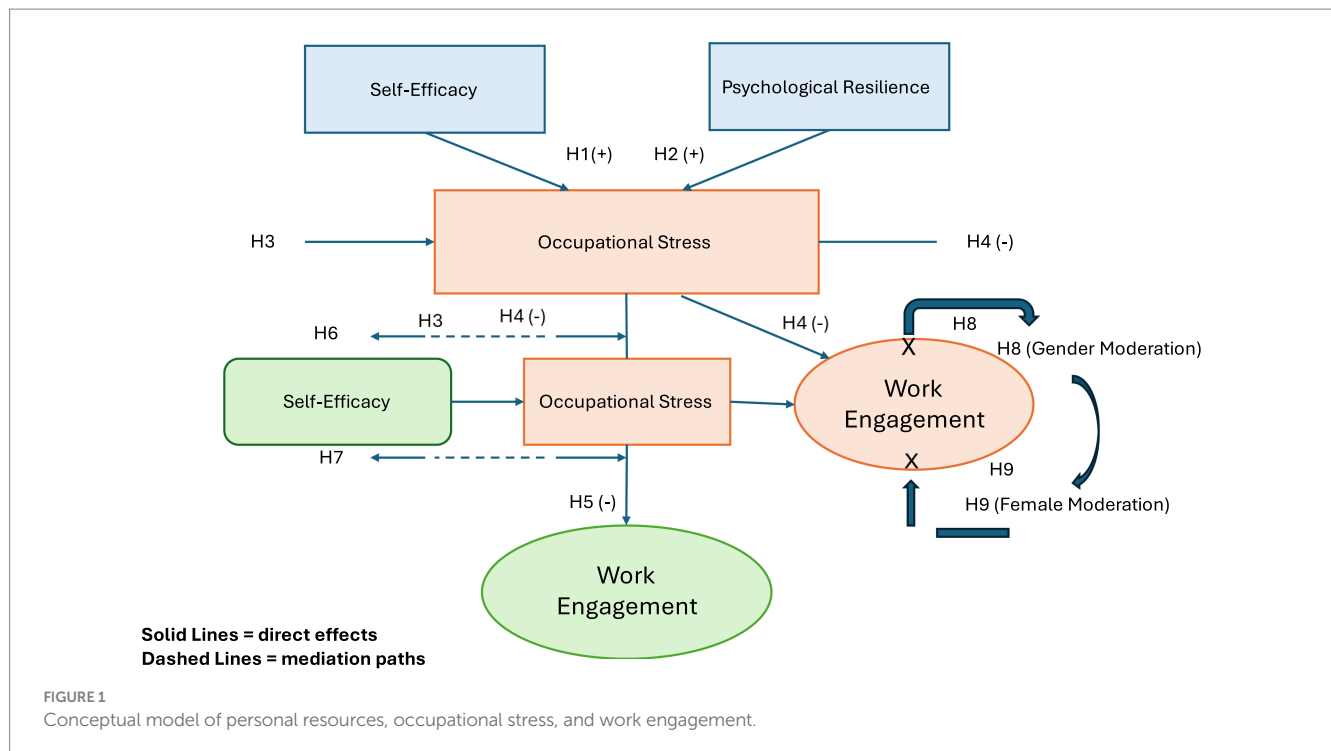
The present research adopted a quantitative, cross-sectional, correlational–explanatory design, aiming to test a structural model incorporating both mediating and moderating effects among

self-efficacy, psychological resilience, occupational stress, and work engagement among university faculty in Arab countries. The Partial Least Squares Structural Equation Modeling (PLS-SEM) approach was employed to assess both the measurement and structural models, drawing on the theoretical foundations of Bandura's Social Cognitive Theory and the Job Demands–Resources (JD-R) Model. This design is well suited for evaluating predictive structural relationships within a single time frame.

Participants and sample characteristics

The final study sample consisted of 266 faculty members, selected through convenience sampling from seven Arab universities located in Saudi Arabia, Egypt, and Sudan. The sample was intentionally diversified in terms of academic disciplines, ranks, and demographic backgrounds to ensure adequate representation of the target population. The demographic and professional characteristics of the participants were as follows:

- Gender: The sample displayed a relatively balanced distribution, allowing for gender-based comparisons. A total of 144 males (54.1%) and 122 females (45.9%) participated in the study.
- Age: Participants represented varied age groups. The majority were over 40 years old (76.7%), followed by those aged 31–40 years (18.8%), and a smaller group under 30 years (4.5%),



indicating that most respondents possessed substantial professional experience.

- Educational Qualification: Most participants held a doctoral degree (74.4%), followed by master's degree holders (13.9%), with the remaining percentage holding a higher diploma or bachelor's degree.
- Nationality: The sample reflected cultural diversity across the Arab region. Egyptians constituted the largest group (47.7%), followed by Sudanese (28.6%), and Saudis (13.2%), with additional participants from Jordan, Tunisia, Yemen, and Iraq.
- Marital Status and Residence: The majority of respondents were married (76.3%), urban residents (91%), and self-reported their economic status as "average" (93.6%). Detailed descriptive statistics are presented in [Table 2](#).

Data collection procedures

Data were collected over a period of 4 months (from October 10, 2024, to February 10, 2025) through both electronic and paper-based questionnaires distributed to university faculty members. Institutional and ethical approvals were obtained in advance, and participants were assured of confidentiality and that their responses would be used for research purposes only. The questionnaire comprised two parts: demographic information (gender, age, academic rank, institution, college, economic level, marital status, and place of residence), and four validated psychometric instruments measuring self-efficacy, psychological resilience, occupational stress, and work engagement. All scales underwent a back-translation process and expert review to ensure cultural appropriateness for Arab academic contexts. On average, participants completed the survey in 10–15 min.

Instruments

Demographic data

This section included variables such as gender, age, academic degree, university, college, socioeconomic level, marital status, and residence location.

Work self-efficacy scale

Adapted from [Pepe et al. \(2010\)](#), this instrument originally comprised 10 items measuring individuals' confidence in successfully performing work-related tasks. Responses were recorded on a 5-point Likert scale ranging from (1) strongly disagree to (5) strongly agree. Six items with the highest factor loadings were retained after psychometric evaluation within the PLS-SEM model, ensuring measurement validity.

Psychological resilience scale

Derived from [Stavem et al. \(2000\)](#), the original scale included 12 items assessing positive adaptation under stress. Following confirmatory analyses, four items representing the general resilience dimension were retained due to their high factor loadings and internal consistency. Responses were rated on a 5-point Likert scale. The retained items demonstrated strong reliability and validity within the adapted version.

Academic occupational stress scale

This customized instrument was developed by the researchers to assess stress factors specific to academic work, including general occupational conditions, teaching, research and publication duties, administrative workload, and quality assurance activities. Of the initial 18 items, four high-loading items were retained to represent the general dimension of occupational stress, using a 5-point Likert

TABLE 2 Demographic characteristics of the sample of participants ($n = 266$ – missing zero).

| Variable | Frequency | Percent |
|--------------------------------------|-----------|---------|
| Sex | | |
| Male | 144 | 54.135 |
| Female | 122 | 45.865 |
| Total | 266 | 100 |
| Age | | |
| Less than 30 | 12 | 4.511 |
| From 31–40 | 50 | 18.797 |
| More than 40 | 204 | 76.692 |
| Total | 266 | 100 |
| Nationality | | |
| Jordanian | 15 | 5.639 |
| Saudi | 35 | 13.158 |
| Tunisian | 8 | 3.008 |
| Sudanese | 76 | 28.571 |
| Yemeni | 3 | 1.128 |
| Egypt | 127 | 47.744 |
| Iraqi | 2 | 0.752 |
| Total | 266 | 100 |
| Academic qualification | | |
| Bachelor's | 11 | 4.135 |
| Postgraduate Diploma | 20 | 7.519 |
| Master's | 37 | 13.91 |
| Doctorate | 198 | 74.436 |
| Total | 266 | 100 |
| College | | |
| Education | 112 | 42.1 |
| Arts and Literature | 44 | 16.5 |
| Sharia and Law | 16 | 6.0 |
| Applied | 10 | 3.8 |
| Business Administration | 3 | 1.1 |
| Science | 12 | 4.5 |
| Engineering | 4 | 1.5 |
| Computer Science and Engineering | 1 | 0.4 |
| Nursing | 2 | 0.8 |
| Public Health and Health Informatics | 9 | 3.4 |
| Pharmacy | 3 | 1.1 |
| Medicine | 4 | 1.5 |
| Applied Medical Sciences | 8 | 3.0 |
| Dental medicine | 2 | 0.8 |
| Others | 36 | 13.5 |
| Total | 266 | 100.0 |
| Economic level | | |
| Poorer than most people | 2 | 0.752 |
| Like most people | 249 | 93.609 |

(Continued)

TABLE 2 (Continued)

| Variable | Frequency | Percent |
|---------------------------|-----------|---------|
| Wealthier than most | 15 | 5.639 |
| Total | 266 | 100 |
| Marital status | | |
| Single | 37 | 13.91 |
| Married | 203 | 76.316 |
| Divorced | 16 | 6.015 |
| Widowed | 10 | 3.759 |
| Total | 266 | 100 |
| Place of residence | | |
| Village | 24 | 9.023 |
| City | 242 | 90.977 |
| Total | 266 | 100 |

response format. Items with low loadings or cross-loadings were excluded to enhance convergent validity.

Work engagement scale

Developed by [Schaufeli et al. \(2002\)](#), the original 17-item scale measures employees' engagement levels through three dimensions—vigor, dedication, and absorption—on a 5-point scale from (1) never to (5) always. Eight items with high factor loadings and internal consistency were selected, integrating the three subdimensions into a single composite construct for the structural model.

Statistical analysis procedures

Data analysis was conducted in two major phases.

Phase one—measurement assessment

Descriptive statistics were first computed to examine sample characteristics. The measurement model was then evaluated by examining factor loadings, Cronbach's alpha, composite reliability (CR), average variance extracted (AVE), and discriminant validity using the Fornell–Larcker criterion and the HTMT ratio.

Phase two—structural model testing

The PLS-SEM analysis was performed using Smart PLS v.4 ([Hair et al., 2024](#)), chosen for its suitability in analyzing complex predictive models with moderate sample sizes and its capacity to estimate direct, indirect, and interactive effects among latent variables. Items with standardized loadings below 0.70 were removed to ensure convergent validity. The model's integrity was further verified by checking variance inflation factors ($VIF < 3$), below the commonly accepted threshold of 5.

As a result, the final model retained six self-efficacy items, four resilience items, four stress items, and eight engagement items. These refinements align with best practices in PLS-SEM, improving both construct robustness and cultural validity. Model fit was assessed through indices such as the Standardized Root Mean Square Residual (SRMR) and the Normed Fit Index (NFI). Additionally, Multi-Group Analysis (MGA) was employed to compare structural paths across gender groups.

Summary of methodology

The applied methodology provided a statistically rigorous framework to examine the hypothesized relationships (H1–H9) within an integrative theoretical model combining the principles of Social Cognitive Theory and the Job Demands–Resources (JD-R) Model. This design facilitates a deeper understanding of the psychological and organizational mechanisms underlying work engagement in the context of Arab higher education.

Psychometric properties of the study measures (reliability and validity)

Using Smart PLS v.4, a mediated–moderated structural model was developed incorporating all four main constructs. Initial analyses evaluated the relationships between 57 observed items and four latent variables, confirming indicator reliability at the criterion level of 0.70 or higher ([Sarstedt et al., 2021](#)). Items below this threshold were removed, and structural paths were subsequently estimated to confirm the model's overall fit.

Reliability was assessed using multiple indices—Cronbach's alpha, composite reliability, and average variance extracted (AVE)—as summarized in [Table 3](#), alongside variance inflation factor (VIF) values, t -statistics, and significance levels.

Reliability and validity assessment

The retained items in the final model exhibited factor loadings ranging from 0.709 to 0.859. The Cronbach's alpha and composite reliability (CR) coefficients ranged from 0.746 to 0.936, while the Average Variance Extracted (AVE) values spanned between 0.567 and 0.645. These indices indicate high internal consistency and strong construct reliability. All items recorded statistically significant and substantial t -values, confirming their contribution to the underlying latent constructs.

Assessment of multicollinearity using the Variance Inflation Factor (VIF) revealed values below 3 ($VIF < 3$), well under the conventional threshold of 5, confirming the absence of multicollinearity among indicators.

Validity evaluation

Both convergent and discriminant validity were assessed through multiple criteria to ensure the robustness of the measurement model.

Convergent validity

Convergent validity was established based on the following indicators:

- All factor loadings were statistically significant and above the recommended threshold of 0.70, ranging from 0.709 to 0.859.
- Average Variance Extracted (AVE) values exceeded 0.50 for all constructs, indicating that the latent variables explained over half of the variance in their indicators (0.567–0.645).
- Composite reliability coefficients were all above 0.70, ranging from 0.751 to 0.936, further confirming consistency and convergent validity.

Discriminant validity

Discriminant validity was verified using three complementary methods:

- *Heterotrait–Monotrait (HTMT) Ratio*

All HTMT values were below the threshold of 0.85 (HTMT < 0.85), confirming clear distinction among the constructs and absence of overlap between latent variables.

- *Fornell–Larcker Criterion (Fornell and Larcker, 1981)*

The square roots of the AVE values for each construct were higher than their corresponding inter-construct correlations, with values ranging between 0.753 and 0.803, providing evidence of strong discriminant validity and conceptual distinctiveness.

- *Cross-Loadings Analysis*

Each item loaded more strongly on its intended construct than on any other construct, indicating well-defined factor structures and satisfactory discriminant validity across all model constructs.

Table 4 displays the detailed cross-loading values for all model indicators, confirming the discriminant robustness of the adapted measurement model.

Model fit assessment

Model fit was evaluated using two widely accepted indices: the Standardized Root Mean Square Residual (SRMR) and the Normed Fit Index (NFI). The SRMR assesses the average magnitude of discrepancies between the observed and predicted correlations in the model, while the NFI indicates how well the hypothesized model reproduces the empirical data.

The results demonstrated a SRMR value of 0.06, which falls below the recommended threshold of 0.08, indicating a good model fit according to Hu and Bentler (1999). The NFI value of 0.78, approaching the ideal reference value of 1.00, suggests a moderate overall fit of the structural model, reflecting an acceptable level of correspondence between the theoretical and observed data structures.

Mediated–moderated model analysis

To examine both direct and indirect effects, and to explore mediating and moderating mechanisms within the proposed model, a series of multi-group PLS-SEM analyses were performed. These analyses were conducted on the total sample, as well as separately for male and female faculty subgroups. Prior to testing structural relationships, the model's measurement invariance across genders was established to ensure that constructs were interpreted equivalently by both male and female participants.

Figure 2 presents the structural model for the overall sample, while Table 5 summarizes the direct and indirect path coefficients for the total sample, male group, and female group, highlighting the differential patterns of mediation and moderation within the Mediated–Moderated Model framework.

Results

Overall sample

The path analysis results for the total sample (Table 5) revealed that all direct effects were statistically significant except for the path between self-efficacy and occupational stress ($p = 0.16$), and the interaction effects of occupational stress \times psychological resilience on work engagement ($p = 0.48$) and occupational stress \times self-efficacy on work engagement ($p = 0.07$).

The indirect effect between psychological resilience and work engagement was statistically significant ($\beta = -0.08$, $p < 0.01$), whereas the indirect path between self-efficacy and work engagement was not significant ($p = 0.25$).

These findings indicate that self-efficacy exerts a significant direct effect on work engagement, but not an indirect one, while psychological resilience exhibits both a positive direct effect and a statistically significant indirect effect on engagement. This highlights the critical roles of self-efficacy and psychological resilience in promoting academic work engagement.

Moreover, occupational stress partially mediated the relationship between psychological resilience and engagement but did not moderate the relationships between self-efficacy, resilience, and work engagement. This underscores the challenging nature of the academic work environment, where resilience functions as a partial buffer against stress and disengagement.

Female sample

Among female faculty members, all direct paths were statistically significant except for the path between psychological resilience and work engagement ($p = 0.08$), and the interaction term occupational stress \times psychological resilience on engagement ($p = 0.37$).

The indirect effect of self-efficacy on work engagement was not statistically significant ($p = 0.06$), suggesting that self-efficacy exerts a positive direct effect but no significant indirect effect on work engagement. Conversely, psychological resilience showed a positive but nonsignificant direct effect, yet a significant indirect effect on engagement.

TABLE 3 Reliability, convergent validity, and multicollinearity indices for the study constructs (self-efficacy, psychological resilience, occupational stress, and work engagement).

| Paths | Items | Outer loadings | VIF | Cronbach's alpha | Composite reliability (rho_a) | Composite reliability (rho_c) | Average variance extracted (AVE) | |
|---|--|--|-------|------------------|-------------------------------|-------------------------------|----------------------------------|-------|
| Occup_str1 < – Occupational stress | I feel very burdened with teaching academic courses to students. | 0.809 | 1.721 | 0.800 | 0.815 | 0.867 | 0.620 | |
| | Occup_str16 < – Occupational stress | Sometimes when I think about my work, I feel a tightness in my chest. | 0.749 | | | | | 2.485 |
| | Occup_str17 < – Occupational stress | Often, my work becomes a great burden. | 0.776 | | | | | 2.583 |
| | Occup_str2 < – Occupational stress | I have a lot of quality work and I'm afraid I have little time to do it. | 0.812 | | | | | 1.762 |
| Resilience11 < – Psychological resilience | I manage my stress levels well. | 0.788 | 1.655 | 0.746 | 0.751 | 0.839 | 0.567 | |
| | Resilience12 < – Psychological resilience | I feel confident and secure in my position. | 0.789 | | | | | 1.575 |
| | Resilience6 < – Psychological resilience | I am good at finding solutions to problems. | 0.709 | | | | | 1.397 |
| | Resilience9 < – Psychological resilience | I try to control events rather than being a victim of circumstances. | 0.723 | | | | | 1.287 |
| Self_eff2 < – Self efficacy | Respecting schedules and work deadlines | 0.755 | 1.887 | 0.873 | 0.878 | 0.904 | 0.612 | |
| | Self_eff4 < – Self efficacy | Focusing all your energy on work. | 0.741 | | | | | 1.602 |
| | Self_eff5 < – Self efficacy | Completing the assigned work. | 0.816 | | | | | 2.098 |
| | Self_eff6 < – Self efficacy | Collaborating with other colleagues. | 0.803 | | | | | 2.638 |
| | Self_eff7 < – Self efficacy | Working with people of different ages. | 0.779 | | | | | 2.343 |
| Self_eff9 < – Self efficacy | Acting effectively with colleagues. | 0.796 | 2.077 | | | | | |

(Continued)

TABLE 3 (Continued)

| Paths | Items | Outer loadings | VIF | Cronbach's alpha | Composite reliability (rho_a) | Composite reliability (rho_c) | Average variance extracted (AVE) |
|--------------------------------|--|----------------|-------|------------------|-------------------------------|-------------------------------|----------------------------------|
| work_eng1 < – work engagement | At work, I feel full of energy. | 0.804 | 2.377 | 0.921 | 0.926 | 0.936 | 0.645 |
| work_eng11 < – work engagement | I love my work, and I am immersed in it. | 0.859 | 2.866 | | | | |
| work_eng2 < – work engagement | My work is useful and purposeful. | 0.758 | 2.070 | | | | |
| work_eng3 < – work engagement | Time flies when I work. | 0.767 | 2.121 | | | | |
| work_eng4 < – work engagement | I feel strong and energetic in my work. | 0.832 | 2.861 | | | | |
| work_eng5 < – work engagement | Enthusiastic about my work. | 0.843 | 2.928 | | | | |
| work_eng7 < – work engagement | My work inspires me. | 0.789 | 2.336 | | | | |
| work_eng9 < – work engagement | I feel happy when I work hard. | 0.766 | 2.079 | | | | |

These results imply that female faculty members rely more heavily on psychological resilience than on self-efficacy to maintain their engagement despite high job demands. Resilience serves as a partial mediator between self-efficacy and engagement, and a full mediator between resilience and engagement. Because self-efficacy plays a comparatively smaller role, occupational stress acts as a significant moderator in the relationship between self-efficacy and work engagement among women.

Male sample

For male participants, all direct paths were statistically significant except for the path between self-efficacy and occupational stress ($p = 0.55$) and the interaction effects involving occupational stress \times resilience on engagement ($p = 0.38$) and occupational stress \times self-efficacy on engagement ($p = 0.90$).

Neither the indirect path between resilience and engagement ($p = 0.10$) nor that between self-efficacy and engagement ($p = 0.63$) reached significance. These findings indicate that both self-efficacy and psychological resilience exert positive direct effects on work engagement without significant mediation via stress.

Male faculty appear to utilize both psychological resources—self-efficacy and resilience—jointly to cope with occupational stress. Accordingly, occupational stress serves as a partial mediator only in the resilience–engagement relationship but does not moderate any of the structural paths for male academics.

Moderation and gender differences

The analysis of moderation and gender-based differences revealed significant variations in the structural relationships among

self-efficacy, resilience, occupational stress, and engagement across genders. Specifically, occupational stress moderated the relationship between self-efficacy and work engagement for female participants only.

Figure 3 illustrates this moderation effect: self-efficacy is mapped on the x-axis, work engagement on the y-axis, and the three lines correspond to high (+1 SD), medium, and low (–1 SD) levels of academic stress. The figure shows that as occupational stress increases, work engagement decreases across different levels of self-efficacy. The moderation effect of academic stress was 0.11, which is relatively small compared with the direct effect of self-efficacy on engagement (0.29).

This suggests that for every one standard deviation increase in academic stress, the strength of the relationship between self-efficacy and engagement decreases by 0.11. Conversely, each one-unit increase in self-efficacy enhances work engagement by 0.29 units, underscoring the protective yet limited buffering role of self-efficacy under high stress conditions.

Discussion

The role of self-efficacy and psychological resilience in work engagement

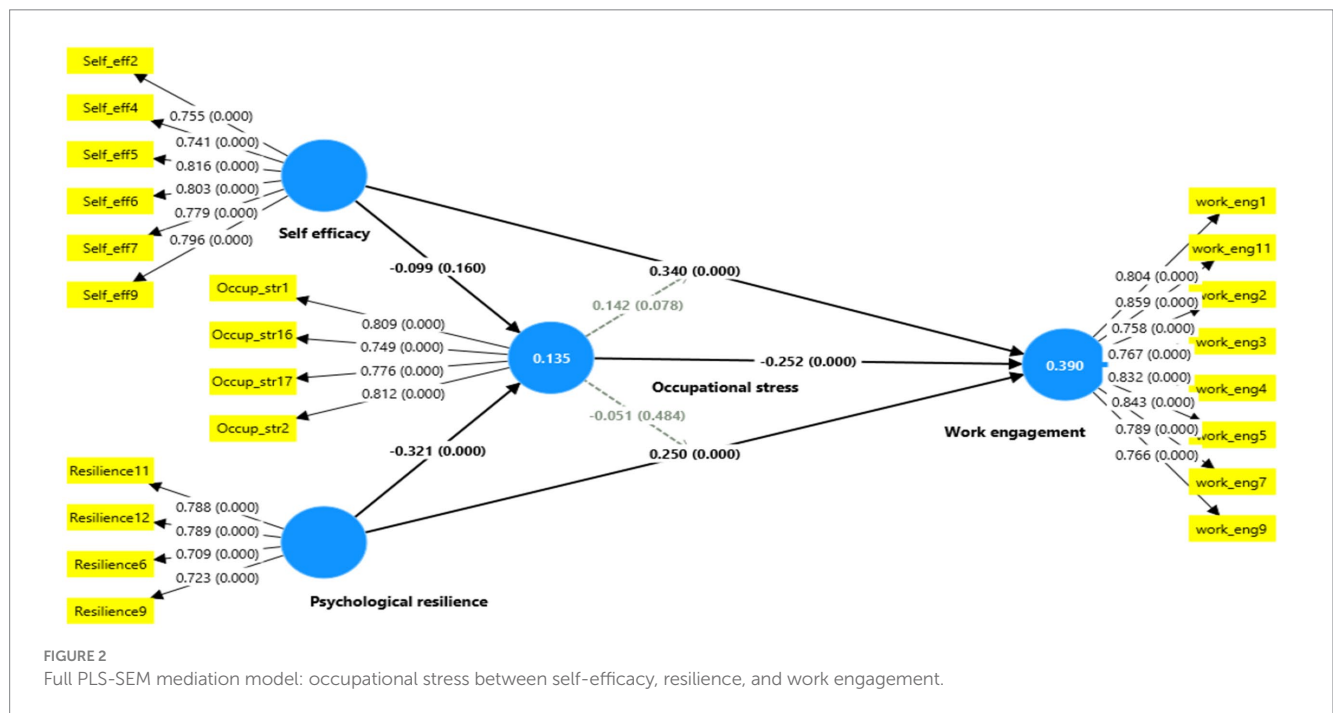
The findings demonstrate that self-efficacy and psychological resilience are key personal resources that substantially contribute to work engagement among university faculty members in Arab institutions. Both constructs exhibited significant positive direct effects on engagement, underscoring their joint role as protective and motivational factors in academic work contexts.

These results are consistent with a large body of prior research. For instance, Xanthopoulou et al. (2007) found that self-efficacy positively correlates with work engagement, while Bakker and Demerouti (2008) highlighted the function of personal resources in enhancing

TABLE 4 Cross-loading of items with their constructions.

| Items | Occupational stress | Psychological resilience | Self-efficacy | Work engagement |
|--------------|---------------------|--------------------------|---------------|-----------------|
| Occup_str1 | 0.809 | -0.356 | -0.161 | -0.359 |
| Occup_str16 | 0.749 | -0.196 | -0.143 | -0.275 |
| Occup_str17 | 0.776 | -0.198 | -0.104 | -0.289 |
| Occup_str2 | 0.812 | -0.327 | -0.241 | -0.303 |
| Resilience11 | -0.289 | 0.788 | 0.32 | 0.308 |
| Resilience12 | -0.262 | 0.789 | 0.26 | 0.387 |
| Resilience6 | -0.208 | 0.709 | 0.212 | 0.282 |
| Resilience9 | -0.302 | 0.723 | 0.26 | 0.355 |
| Self_eff2 | -0.225 | 0.275 | 0.755 | 0.316 |
| Self_eff4 | -0.177 | 0.271 | 0.741 | 0.424 |
| Self_eff5 | -0.217 | 0.304 | 0.816 | 0.426 |
| Self_eff6 | -0.129 | 0.245 | 0.803 | 0.335 |
| Self_eff7 | -0.125 | 0.29 | 0.779 | 0.353 |
| Self_eff9 | -0.104 | 0.258 | 0.796 | 0.382 |
| work_eng1 | -0.46 | 0.396 | 0.367 | 0.804 |
| work_eng11 | -0.372 | 0.413 | 0.457 | 0.859 |
| work_eng2 | -0.26 | 0.34 | 0.376 | 0.758 |
| work_eng3 | -0.216 | 0.338 | 0.372 | 0.767 |
| work_eng4 | -0.368 | 0.343 | 0.355 | 0.832 |
| work_eng5 | -0.303 | 0.341 | 0.431 | 0.843 |
| work_eng7 | -0.282 | 0.361 | 0.339 | 0.789 |
| work_eng9 | -0.225 | 0.327 | 0.394 | 0.766 |

Bold values indicate the highest loading of each item on its intended latent construct.



engagement as part of the Job Demands–Resources (JD-R) model. Similarly, Luthans et al. (2007) demonstrated that positive psychological resources—particularly self-efficacy and

resilience—jointly foster performance and well-being at work. Studies by Rothmann and Jordaan (2006) and Mache et al. (2014) further confirmed positive associations between these constructs and

TABLE 5 PLS-SEM path coefficients by hypothesis and gender comparison.

| Hypothesis | Path | Total beta | Total t | Total p | Males beta | Males p | Females beta | Females p | Effect type | Decision (Hypotheses) | Supported |
|------------|--|------------|---------|---------|------------|---------|--------------|-----------|-------------|------------------------------|-----------|
| H1 | Self-efficacy → Work engagement | 0.340*** | 4.93 | 0.000 | 0.276** | 0.002 | 0.289*** | 0.001 | Direct | H1: Supported | Yes |
| H2 | Psychological resilience → Work engagement | 0.250*** | 3.577 | 0.000 | 0.390*** | 0.000 | 0.153 | 0.085 | Direct | H2: Supported (H8) | Yes |
| H3 | Self-efficacy → Occupational stress | -0.099 | 1.404 | 0.16 | -0.055 | 0.552 | -0.217* | 0.026 | Direct | H3: Not supported (H8) | No |
| H4 | Psychological resilience → Occupational stress | -0.321*** | 4.584 | 0.000 | -0.261** | 0.003 | -0.370*** | 0.001 | Direct | H4: Supported (H8) | Yes |
| H5 | Occupational stress → Work engagement | -0.252*** | 3.484 | 0.000 | -0.230* | 0.015 | -0.307*** | 0.000 | Direct | H5: Supported (H8) | Yes |
| H6 | Psychological resilience → Work engagement (via Occupational stress) | 0.081* | 2.458 | 0.014 | - | - | 0.114* | 0.023 | Indirect | H6: Partial mediation | Yes |
| H7 | Self-efficacy → Work engagement (via Occupational stress) | 0.025 | 1.134 | 0.257 | - | - | 0.067 | 0.067 | Indirect | H7: Not supported | No |
| H8 | Multi-group path differences (all paths above) | - | - | - | - | - | - | - | Direct | H8: Supported | Yes |
| H9 | Occupational stress × Self-efficacy → Work engagement | 0.142 | 1.765 | 0.078 | 0.014 | 0.902 | 0.209** | 0.011 | Moderation | H9: Supported (Females only) | Yes |

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. H8 supported by multi-group analysis (MICOM/permutation tests) showing significant path coefficient differences across gender groups for multiple paths. Dashes (–) indicate paths not estimated separately in subgroup models.

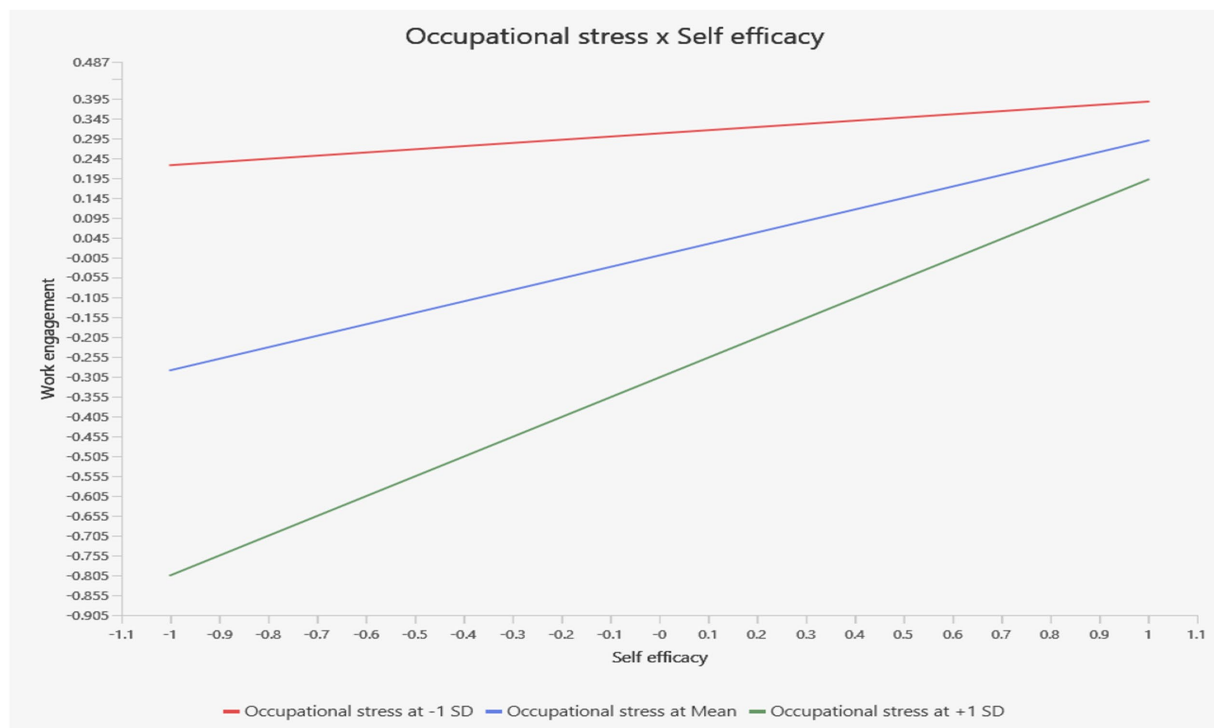


FIGURE 3
Moderating effect of occupational stress on self-efficacy → work engagement for female sample.

engagement, while [Britt et al. \(2016\)](#) emphasized resilience as a key predictor of sustained engagement under occupational stress.

However, a few studies have reported divergent findings. For example, [Skaalvik and Skaalvik \(2014\)](#) observed that self-efficacy exerted only a limited influence on teachers' engagement, and [Simbula et al. \(2011\)](#) suggested that this relationship is context-dependent and mediated by situational factors.

These discrepancies underscore the relevance of cultural context when interpreting such relationships. Given that the present study was conducted in Arab higher education settings, factors such as collectivist values, social norms, and institutional environments may shape how personal resources relate to engagement. [Hu et al. \(2011\)](#) noted that cross-cultural variations in the effect of personal resources on engagement may arise from differences in both conceptual frameworks and measurement tools.

Future research should therefore explore cross-contextual dynamics, including the temporal and situational variability of these relationships, as well as potential interactive mechanisms between self-efficacy and resilience. These insights could deepen theoretical understanding and inform targeted interventions to enhance faculty engagement.

The observed positive effects can be interpreted through Social Cognitive Theory ([Bandura, 1986](#)), Conservation of Resources Theory ([Hobfoll, 2002](#)), and the JD-R Model ([Bakker and Demerouti, 2017](#)). Self-efficacy enhances confidence in one's ability to meet professional demands, boosting motivation and persistence. Resilience, in turn, helps individuals effectively adapt to stressors and maintain high engagement levels even under challenging academic conditions.

Mediation effects of academic occupational stress and gender differences

Results revealed that academic occupational stress partially mediated the relationship between resilience and engagement among the overall and male samples and fully mediated this relationship among females. It also partially mediated the link between self-efficacy and engagement among women. Additionally, occupational stress exerted strong negative direct effects on engagement, indicating the substantial pressures inherent in academic environments across Arab universities.

These stressors likely derive from multiple sources, such as teaching overloads, research and publication demands, administrative responsibilities, community service, and quality assurance duties. Importantly, the relationship between stress and engagement may not be linear: moderate stress can sometimes enhance engagement by promoting challenge appraisals, whereas excessive stress undermines motivation and performance.

Gender differences in stress perception and coping also emerged. This aligns with [Tytherleigh et al. \(2007\)](#), who found gender-based discrepancies in identifying and managing occupational stressors, and with [Mache et al. \(2014\)](#), who reported that women tend to rely more on resilience-oriented coping strategies. The current results thus support the idea that males and females employ different personal resources to navigate academic demands.

Consistent with earlier work by [Kinman and Jones \(2008\)](#), [Barkhuizen and Rothmann \(2008\)](#), and [Watts and Robertson \(2011\)](#), the current study found negative correlations between academic stress and

engagement. Yet earlier research such as [Abouserie \(1996\)](#) and [Gillespie et al. \(2001\)](#) suggest that for some academics, stress can stimulate achievement, with effects varying by career stage and experience.

From a theoretical standpoint, the mediating role of academic stress can be explained within the JD-R framework ([Bakker and Demerouti, 2017](#)): stress represents a job demand that depletes personal resources, thereby reducing engagement. However, self-efficacy and resilience operate as protective personal resources, mitigating these adverse effects.

Moderating effect of academic occupational stress

For female participants, academic stress moderated the relationship between self-efficacy and engagement—indicating that the strength of this relationship depends on the level of stress experienced. This result mirrors findings by [Xanthopoulou et al. \(2007\)](#) and [Bakker et al. \(2010\)](#), which confirmed stress's moderating role between personal resources and organizational outcomes. Similarly, [Barkhuizen and Rothmann \(2006\)](#) found that the positive effects of personal resources on well-being were most pronounced under high-stress conditions.

By contrast, other studies such as [Simbula et al. \(2011\)](#) and [Schaufeli and Taris \(2014\)](#) did not support a significant moderating influence, suggesting the relationship's sensitivity to context and occupational setting.

This moderating effect can be interpreted through Cognitive Appraisal Theory ([Lazarus and Folkman, 1984](#)), which posits that stress effects depend on individuals' perception and evaluation of stressors. Female academics may perceive self-efficacy as a particularly critical personal resource to maintain engagement despite elevated stress levels. Within the JD-R model, self-efficacy thus buffers stress's negative influences, functioning as a key motivational resource that sustains engagement among women in academia.

Gender differences in managing self-efficacy, resilience, and academic stress

The results revealed notable gender differences in how self-efficacy and resilience predict engagement. While resilience played a stronger role for females, self-efficacy had a greater influence among males. These distinctions suggest that men and women utilize different coping mechanisms to deal with academic demands, supporting findings from [Mache et al. \(2014\)](#).

This distinction aligns with [Huang \(2013\)](#), who found that men display higher self-efficacy levels in certain academic domains—especially in science and technology—yet differs from [Schaufeli et al. \(2006\)](#), who reported no significant gender differences in engagement.

Such inconsistencies may stem from multiple factors, including biological differences, social role expectations, and institutional structures. For instance, [Taylor et al. \(2000\)](#) found biological variations between genders in stress responses, affecting how personal resources are utilized. From a socio-cultural perspective, [Eagly and Wood \(2012\)](#) argue that cultural role expectations predispose men to demonstrate competence and confidence, while women are socially encouraged toward flexibility and adaptability.

In Arab societies, these social expectations may be reinforced by cultural norms and constraints, such as limited work–life balance and societal pressures regarding women's roles. Studies like [O'Laughlin and Bischoff \(2005\)](#) have shown that such pressures compel women to rely more heavily on resilience as a survival and adaptation mechanism. Moreover, social learning processes ([Bussey and Bandura, 1999](#)) influence how gendered behaviors and coping strategies develop over time.

Institutional contexts also matter. Some Arab universities maintain gender-segregated education systems (e.g., Saudi Arabia), while others adopt coeducational models, potentially shaping professional experiences and engagement patterns differently across genders.

Overall, these findings emphasize the importance of contextual sensitivity and gender awareness in examining how personal resources, stress, and engagement interact within Arab higher education environments.

Theoretical synthesis and practical applications

Findings from the structural model indicate that self-efficacy and psychological resilience serve as critical personal resources in explaining work engagement among faculty members in Arab universities. Both variables exhibited significant positive direct effects on engagement, while occupational stress demonstrated a strong negative impact. Psychological resilience also contributed to reducing perceived stress, confirming its protective role in demanding academic environments.

Moreover, results revealed that occupational stress partially mediated the link between psychological resilience and work engagement in the overall sample, whereas its mediating role between self-efficacy and engagement was limited. This suggests that self-efficacy influences engagement primarily through direct motivational pathways, rather than indirectly by reducing stress levels.

Gender-based analyses emphasized the importance of considering sex as a moderating factor in understanding academic engagement. The effect of resilience on engagement was stronger among male faculty, while its stress-buffering function appeared more pronounced among females. Additionally, occupational stress weakened the positive relationship between self-efficacy and engagement among women but not men. These patterns indicate that faculty members employ personal resources in gender-specific ways when coping with academic demands—supporting the need for gender-sensitive approaches to understanding and promoting engagement in higher education across Arab contexts.

Practical implications

In light of these findings, universities are encouraged to design training programs that take psychological factors into account in order to enhance faculty members' competence and adaptability through workshops addressing academic stressors. These initiatives target occupational stress as the mechanism through which enhanced personal resources translate into sustained job commitment, consistent with the observed partial mediation. Institutions should also re-evaluate opaque promotion criteria and inequalities in

workload distribution, while providing gender-sensitive support in recognition of the higher stress levels reported among women and the weaker association between their self-efficacy and job commitment. Supportive leadership that fosters psychological safety, alongside a culture that values resilience, can help maintain job commitment across teaching, research, and service roles.

Limitations and future research directions

Despite the robustness of the tested model and the diversity of participating universities, this study remains limited by its cross-sectional design, which restricts causal inference regarding the directionality among self-efficacy, resilience, stress, and engagement. Future research should employ longitudinal or experimental designs to examine temporal dynamics and the impact of targeted interventions on these variables.

Additionally, the study's scope was confined to universities in three Arab countries (Saudi Arabia, Egypt, and Sudan), which may constrain the generalizability of the findings to other higher education systems with distinct cultural and organizational characteristics. Therefore, it is recommended that future studies replicate the model across diverse Arab and international contexts, conducting cross-cultural and interregional comparisons to test the stability of the observed relationships.

Subsequent research could also extend the model to incorporate organizational-level constructs—such as institutional support, organizational justice, and academic leadership styles—to provide a more comprehensive understanding of how personal and structural resources jointly shape faculty stress and engagement within higher education.

Data availability statement

The datasets generated and analyzed for this study are available from the corresponding author on reasonable request, in accordance with institutional and ethical guidelines.

Ethics statement

The studies involving humans were approved by The Research Ethics Committee at the University of Hail (Approval Date: October 7, 2024). The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation was not required from the participants or the participants' legal guardians/next of kin because data were collected anonymously through

a self-administered online questionnaire, and participants' consent was implied by their voluntary completion of the survey.

Author contributions

AZ: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. MS: Conceptualization, Project administration, Supervision, Visualization, Writing – review & editing, Methodology. BB: Supervision, Visualization, Writing – review & editing, Methodology. AM: Supervision, Visualization, Writing – review & editing. HH: Supervision, Visualization, Writing – review & editing. HA: Supervision, Visualization, Writing – review & editing.

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Conflict of interest

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The author(s) declared that Generative AI was not used in the creation of this manuscript.

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