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An Integrated Business Process Management Framework for the Enhancement of Academic Operations through Digital Transformation at Universities of Technology

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Abstract

This study investigates the impact aligning Business Process Management (BPM) practices with digital innovation can have on improving academic staff productivity and facilitating effective teaching in Universities of Technology (UoTs). The growing complexity of academic roles and the swift advancement of digital technologies have led to a reassessment of the organisation and support for academic work in higher education. Based on a wider research initiative targeting enhanced job satisfaction and productivity in academia, this paper focuses specifically on the digital processes and teaching aspects that affect academics' performance. A quantitative approach was used in this study, driven by two main objectives: (1) to analyse existing BPM practices, and (2) to investigate the influence of digital innovation on productivity and job satisfaction among academic staff at the selected UoTs. Quantitative data were collected through an online survey involving 223 academics from two South African universities of technology and analysed using Structural Equation Modelling (SEM). The findings indicated statistically significant correlations among BPM practices, digital innovation and academic outcomes. Digital innovation significantly enhanced productivity and satisfaction, and BPM practices also had a favourable impact. The model accounted for a large portion of the variance in academic productivity and job satisfaction, demonstrating considerable predictive capability. The study proposed an integrated BPM framework designed specifically for the academic environment of UoTs. The model integrates administrative roles with educational methods and digital infrastructure, fostering effectiveness and a unified, technology-supported academic setting.

Keywords: Academic staff, business process management, digital innovation, productivity

Introduction

With the transformation in higher education, there has been a surge in academic staff experiencing increased pressures on both institutional restructuring, governance and administration, as well as digital transformation (Bhumika, 2020; Iwu *et al.,* 2022). The conflict between the vocational legacy of the UoTs and their emerging research and innovation responsibilities adds further pressure on academic staff to transition to a mixed teaching format, changes in administration, and the development of new performance criteria (Ntombana *et al.,* 2023; Luzipho, Joubert & Dhurup, 2023).

While digital technology has the potential to improve teaching quality and operational productivity, its incorporation frequently clashes with institutional norms, leading to diverse student experiences (Hashim, Tlemsani & Mathews, 2022; Alenezi, 2023). Shoaib *et al.* (2022) pointed out that the sudden shift to online teaching and learning during the COVID-19 outbreak revealed

considerable shortcomings in universities' digital preparedness, increasing the strain on academics who were already faced with diverse and growing obligations. Concurrently, inefficiencies in organisations—like slow processes, fragmented systems and misaligned decision-making, have obstructed the possible advantages of digital transformation (Pridmore & Godin, 2021; Kotzé, 2022).

To address these issues, BPM has arisen as a strategic instrument for enhancing organisational workflows and synchronising institutional activities with academic requirements (Grisold *et al.,* 2021; Tapia *et al.,* 2023). In numerous South African UoTs, the implementation of BPM has mainly focused on administrative areas, with minimal connection to essential academic processes like teaching, curriculum development, and digital interaction (Koopman & Seymour, 2020; Mabidi, 2024). The gap between BPM systems and the digital tools employed in education leads to inefficiencies and has an adverse impact on the productivity and job satisfaction of academic staff.

Rooted in the Sociotechnical Systems Theory (SST) and the Job Demands-Resources (JD-R) model, the research utilised a quantitative method to explore the relationship between BPM practices, digital adoption and academic outcomes. SEM was employed to evaluate a conceptual framework designed to synchronise administrative and academic operations through digital transformation. This research examined the impact of integrating BPM practices with digital innovation processes on the productivity and job satisfaction of academic staff at two South African UoTs.

Following this introduction, the paper provides an extensive literature review before outlining in detail the research methodology adopted to collect and analyse the data. The paper then reports the research findings and discusses their relevance to the current literature. Finally, the paper presents the conclusions drawn from the findings and suggests possible future research directions.

Literature review

This part examines current studies on BPM, digital transformation and academic staff productivity in higher education. It examines the impact of BPM practices and digital platforms on teaching effectiveness and employee well-being, especially in South African Universities of Technology. The discourse is structured around the JD-R model and SST to emphasise the essential theoretical and empirical findings that inform this research.

Business process management and academic productivity in higher education

Recent changes in higher education have highlighted operational efficiency and academic achievement more clearly. BPM has become a key strategy for enhancing workflows in universities, but most deployments usually focus on administrative sectors, neglecting essential academic activities (Pridmore & Godin, 2021; Kotzé, 2022). In South African UoTs, the growing demands on academic staff from teaching, research, administrative responsibilities and community engagements make the absence of cohesive BPM systems that align with educational processes particularly problematic (Luzipho, *et al*., 2023).

Although global research has demonstrated the advantages of BPM in improving institutional agility and service quality, limited studies have investigated its function in assisting academic roles within a digitally changing environment (Grisold *et al.,* 2021; Santos & Trigo, 2025). Tapia *et al.* (2023) observed that the adoption of BPM resulted in enhanced academic planning and performance assessment; however, these initiatives remain fragmented with African institutions. This fragmentation frequently leads to repetitive tasks, postponed approvals and varying levels of academic support, all of which negatively impact teaching quality and employee satisfaction.

Digital transformation and teaching efficiency in UoTs

The COVID-19 pandemic accelerated the use of digital technologies in higher education and exposed long-standing issues concerning infrastructure readiness, platform compatibility,

and digital skills. For many academic staff, particularly in UoTs, the abrupt transition to blended and online teaching introduced new difficulties while exacerbating existing workload problems (Shoaib *et al.,* 2022; Alenezi, 2023). Platforms such as Blackboard, Moodle, and Microsoft (MS) Teams have become crucial tools; however, their incorporation often reveals a lack of strategic alignment with institutional processes (Hashim *et al.,* 2022).

While digital platforms can enhance flexibility and student engagement, their success depends on how well they align with institutional practices and educational strategies. In many South African universities, the drive for digital transformation has been obstructed by inadequate change management, a lack of staff training, and unstable infrastructure, especially in historically disadvantaged institutions (Van der Walt, 2021).

The COVID-19 pandemic exposed the deficiencies in digital preparedness within UoTs and underscored the imperative for structured methodologies to manage academic processes (Shoaib *et al.,* 2022; Alenezi, 2023). BPM has become an essential tool for synchronising organisational systems with the sudden demands of online and blended teaching and learning (Hashim *et al.,* 2022). Nevertheless, the pandemic demonstrated that BPM should not be seen solely as a technical or administrative tool; it needs to be analysed from theoretical perspectives that clarify how academics perceive job demands, resources, and system integration (Schaufeli, 2017; Demerouti & Bakker, 2023). COVID-19 highlighted how insufficient resources and poor alignment between digital platforms and institutional strategies, along with rising workloads, adversely impacted academics' well-being and productivity (Van der Walt, 2021). These obstacles confirm the necessity to reassess and utilise theoretical frameworks like the JD-R model and SST, which collectively offer the analytical basis for comprehending how BPM can improve both institutional effectiveness and employee satisfaction in a swiftly evolving higher education landscape (Legemaate *et al.,* 2022; Ali *et al.,* 2024).

Theoretical framework

This study hinges on a hybrid theoretical framework that integrates the JD-R model and SST. Combining SST with the JD-R model enables UoTs to tackle systemic inefficiencies, academic personnel workload issues and challenges associated with BPM adoption, thereby promoting a more effective academic atmosphere (Schaufeli, 2017; Demerouti & Bakker, 2023; Irehill *et al.,* 2023). This information can assist UoTs in developing policies and strategies to enhance BPM systems, maintaining a balance between technological effectiveness and human-focused academic procedures (Hlad'o *et al.,* 2020; Li *et al.,* 2022).

The JD-R model offers an organised approach for examining the impact of work-related stressors and accessible support mechanisms on the performance and well-being of academic staff (Demerouti & Bakker, 2023). In a university environment, factors such as increased teaching duties, administrative responsibilities and technological distractions are significant stressors. On the other hand, resources at work, such as available digital tools, support from the institution, and autonomy, can reduce burnout and enhance engagement (Nair, McGregor & Caputi, 2020; Dixit & Upadhyay, 2021).

Recent studies have validated the JD-R model in higher education settings, illustrating how adequate resources can alleviate the effects of elevated demands, especially during transitions to remote teaching and changes in curricula (Schaufeli, 2017; Jagodics & Szabo, 2023). This study employed the JD-R model to evaluate if BPM-related innovations served as job resources that enhanced productivity and satisfaction in UoTs.

SST highlights the connection between technological systems and the processes of human work (Ali *et al.,* 2024). It suggests that institutions perform better when their technical infrastructure and social systems, such as communication, collaboration, and role clarity, are aligned. Within BPM, SST advocates that systems must be crafted not only for efficiency but also to enable end-users, such as academic staff (Legemaate *et al.,* 2022). SST has been extensively utilised in education to

examine Learning Management Systems' (LMS) adoption, participatory system design, and digital preparedness (Navarro-Bringas *et al.,* 2020; Aseeri & Kang, 2023). This study's application emphasises the necessity of developing BPM frameworks that represent the realities of academic work and promote engagement through user-centred design.

Integrating BPM, digital tools, and academic workflows

Even though BPM and digital platforms have demonstrated their potential, their integration into academic workflows varies across South African UoTs. Academic staff often encounter isolated systems that do not communicate effectively and hinder thorough teaching delivery (Tapia *et al.,* 2023). This results in inefficiency, wasted time and dissatisfaction, which weaken the overall goals of digital transformation and institutional efficiency (Mabidi, 2024).

Santos and Trigo (2025) argue that successful BPM frameworks in higher education must transcend mere automation; they should promote collaboration, transparency and flexibility. Additionally, research, such as that carried out by Luzipho *et al.* (2023), emphasises the importance of combining BPM systems with digital learning platforms to reduce redundancy, improve planning, and foster innovation. However, a deficiency of empirical studies in South Africa exploring this intersection in a UoT context, highlights a notable gap that this research intends to address.

Methods

This study used a quantitative approach to examine the relationship between BPM practices, digital innovations and educational outcomes, focusing on productivity and job satisfaction. A systematic, self-completed survey was used to gather information from academic staff at two South African UoTs. The tool was developed using current literature and comprised five-point Likert-scale questions centred on institutional operations, digital incorporation, job satisfaction and productivity of academic staff. The survey was distributed digitally via QuestionPro to guarantee broad coverage and efficient data gathering.

The sample consisted of 223 participants, including junior lecturers, lecturers, senior lecturers, associate professors and professors. This method guaranteed the participation of individuals actively engaged in BPM-related or digital academic activities. Before full deployment, the questionnaire was evaluated by experts and underwent pilot testing to confirm clarity, relevance and content validity. Approval was secured from the appropriate institutional committees (University A: IREC 086/24 and University B: RD1/32/2024), and confidentiality and anonymity for all participants were guaranteed in line with research ethics standards.

Data analysis was conducted using a two-step SEM approach with SPSS and AMOS, as suggested by Hair *et al.* (2024). Initially, Exploratory Factor Analysis (EFA) was performed to uncover hidden factor structures and simplify item complexity. The Kaiser-Meyer-Olkin (KMO) test, along with Bartlett's test of sphericity, validated the adequacy of the samples (Tabachnick & Fidell, 2019). Principal axis factoring with Varimax rotation was used to identify underlying constructs. Afterward, Confirmatory Factor Analysis (CFA) evaluated construct validity and assessed model fit. Reliability was evaluated using Cronbach's alpha and composite reliability (CR), with values above 0.70 indicating internal consistency. Convergent validity was established with Average Variance Extracted (AVE) values surpassing 0.50, whereas discriminant validity was demonstrated when the square root of AVE was greater than the correlations among constructs (Voorhees *et al.,* 2022; Hair *et al.,* 2024). Model fit was evaluated using conventional indices: χ^2, CFI, TLI, RMSEA, SRMR, and RMS-theta (Kline, 2023; Hair *et al.,* 2024).

Results

This section offers a thorough examination of the survey data through descriptive statistics.

Demographic statistics

A total of 223 academics from two UoTs participated in the survey. The sample showed an almost equal gender distribution (50.7% female; 49.3% male), which is crucial for analysing BPM

factors that are attentive to gender differences in work responsibilities and administrative demands (Magwegwe & Sithole, 2024; Han, 2024). The majority of respondents were mid-career academics, with 44.8% in the 31–40 age range, followed by 19.3% aged 41–50, 18.8% aged 51–65, and 17% aged 21–30, which supports findings that mid-career positions frequently involve greater process stress and organisational duties (Baker & Manning, 2021; Piano *et al.,* 2024). Regarding designation, lecturers constituted the largest group (57.8%), followed by junior lecturers (25.1%), senior lecturers (14.8%), associate professors (1.8%), and professors (0.4%), highlighting the prevalence of teaching-orientated personnel in BPM-related activities (Simpson & Shaw, 2023). Representation from institutions corresponded to staff numbers, with 61% from University A and 39% from University B, while teaching experience varied among early-career (0–5 years, 31.8%), intermediate (6–10 years, 22%), mid-career (11–20 years, 31.4%) and senior academics (20+ years, 14.3%). This combination guaranteed that perspectives from various career stages were included, aiding in the development of a tailored BPM framework responsive to the needs of academics at different career stages (Guillén-Gámez, 2021; Dos Santos *et al.,* 2024). Table 1 below illustrates the demographic data statistics of the respondents.

Table 1: Demographic statistics

Variables	Category	Frequency (N= 223)	Percentage (%)
Gender	Female	113	50,7
	Male	110	49,3
Age	21 - 30	38	17,0
	31 - 40	100	44,8
	41 - 50	43	19,3
	51 - 65	42	18,8
Designation	Junior Lecturer	56	25,1
	Lecturer	129	57,8
	Senior Lecturer	33	14,8
	Associate Professor	4	1,8
	Professor	1	0,4
Affiliation	University A	136	61,0
	University B	87	39,0
Lecturing experience	0 - 5	71	31,8
	6 - 10	49	22,0
	11 - 20	70	31,4
	21 - 30	23	10,3
	31 years or more	9	4,0

Source: (Author's own field data, 2025)

This demographic examination enhances the study's empirical basis by connecting academic profiles to results of BPM implementation. Studies indicate that age, position and experience influence how academics interact with institutional systems and digital resources (Sliz *et al.,* 2021; Kelder *et al.,* 2025). In the context of South Africa, disparities in digital skills among different groups can impede transformation initiatives (Kanyane, 2023). These results support the development of an integrated BPM framework that addresses various academic requirements and productivity factors (Mendonça, *et al.,* 2023).

Measurement model

A confirmatory factor analysis (CFA) utilising AMOS was performed within the SEM context to validate the measurement model and evaluate the underlying construct framework. Therefore, Figure 1 below depicts the constructs' results.

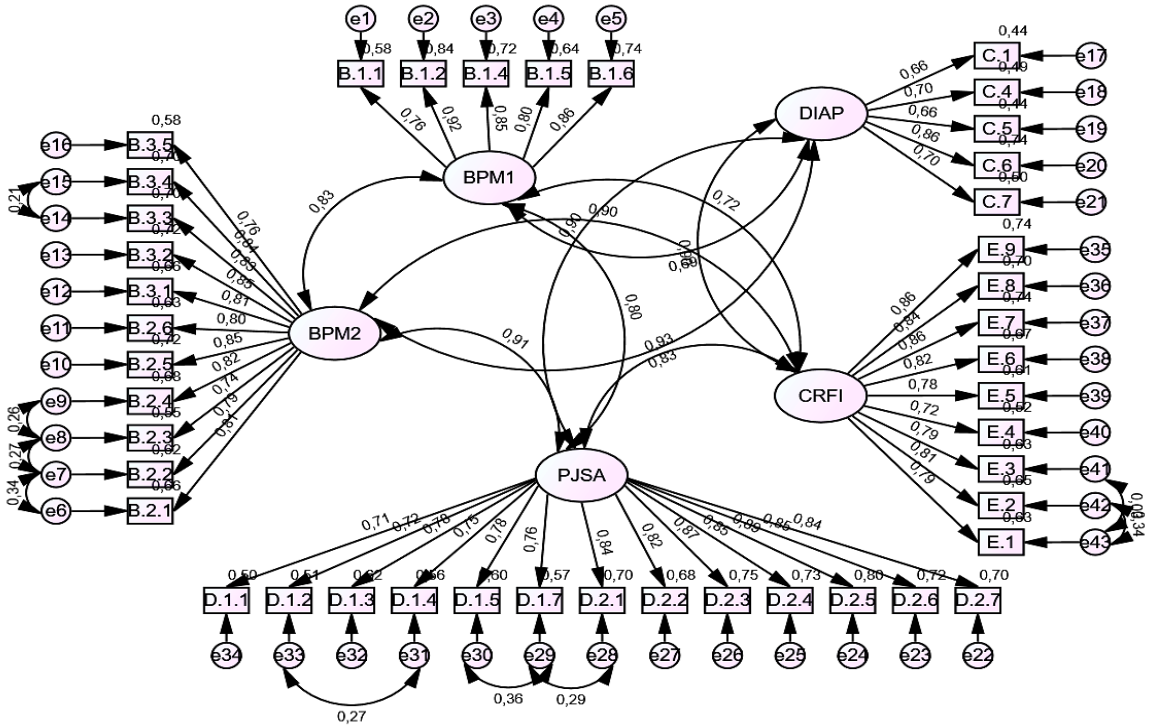

Figure 1: Measurement model of the study *(Authors' own field data, 2025)*

The measurement model of the study included four latent constructs: BPM1 (awareness and implementation) and BPM2 (process improvement initiatives), Digital Innovation in Academic Processes (DIAP), Productivity and Job Satisfaction of Academics (PJSA) and Critical Factors Affecting BPM-Driven Innovation (CRFI). Every construct was assessed with various items sourced from the literature and verified through CFA within the AMOS SEM framework. The BPM framework was split into two components: BPM1 (Awareness and Implementation) and BPM2 (Process Enhancement). Upon removing two low-loading items (BPM 1.3 and BPM 3.6), the other items showed robust factor loadings exceeding 0.70, except for B.3.5 (0.58), which was kept because of its theoretical significance.

DIAP was assessed using five items, with four of them satisfying the reliability criterion. One item (C.1) was kept even with a lower loading (0.44) because of its conceptual fit. The CRFI framework comprised nine items, each showing high loadings ranging from 0.70 to 0.88, which signifies robust convergent validity. PJSA was evaluated through thirteen components that encompassed aspects of both productivity and job satisfaction for academics. The majority of items surpassed 0.70, although three borderline items (0.50-0.66) were kept for theoretical inclusion. In general, the model demonstrated strong internal consistency and validity.

The CFA validated an acceptable model fit and construct validity, following recognised indices, such as Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR). Using CFA within SEM met the need for confirmatory validation in BPM studies in higher education, consistent with recent research highlighting theoretical accuracy and empirical robustness (Cheung *et al.,* 2024; Hair *et al.,* 2024; Xiong *et al.,* 2025).

Construct fit model assessment

The construct model was evaluated through CFA in an SEM context using AMOS, emphasising model fit, reliability and discriminant validity. Fit indices CFI, TLI, RMSEA, and SRMR were employed to assess the suitability of different model structures for each latent construct (BPM, DIAP, PJSA and CRFI), as outlined in Table 4

below. The correlated two-factor model showed the best fit for BPM (CFI of 0.942; RMSEA of 0.084) and PJSA (CFI of 0.974; RMSEA of 0.065), highlighting their multidimensional traits. For DIAP and CRFI, single-factor models with correlated errors showed the optimal fit (DIAP: CFI of 0.923; RMSEA of 0.141; CRFI: CFI of 0.993; RMSEA of 0.045), supporting their one-dimensional nature with some overlap in item-level assessments.

Table 4: Construct model fit indices

Factor	Model	CFI	TLI	RMSEA	SRMR
B	Single factor	0.863	0.844	0.128	0.065
	Single factor with correlated errors (CE) permitted	0.876	0.858	0.123	0.063
	2 Factors only	**0.942**	**0.933**	**0.084**	**0.044**
	2 Factor with correlated factors	0.942	0.933	0.084	0.044
	2 Factors with correlated factors and CE permitted	0.942	0.933	0.085	0.043
C	Single factor	0.914	0.871	0.132	0.054
	Single factor with CE permitted	0.919	0.846	0.145	0.051
	2 Factors only	0.919	0.869	0.133	0.053
	2 Factors with correlated factors	0.919	0.869	0.133	0.053
	2 Factor with correlated factors and CE permitted	**0.923**	**0.854**	**0.141**	**0.052**
D	Single factor	0.944	0.934	0.094	0.039
	Single factor with CE permitted	0.946	0.936	0.092	0.038
	2 Factors only	0.974	0.968	0.065	0.029
	2 Factors with correlated factors	0.974	0.968	0.065	0.029
	2 Factors with correlated factors and CE permitted	**0.974**	**0.969**	**0.064**	**0.029**
E	Single factor	0.976	0.969	0.078	0.026
	Single factor with CE permitted	0.989	0.984	0.055	0.023
	2 Factors only	0.985	0.980	0.063	0.024
	2 Factors with correlated factors	0.985	0.980	0.063	0.024
	2 Factors with correlated factors and CE permitted	**0.993**	**0.989**	**0.045**	**0.020**

Source: (Authors' own field data, 2025)

These findings validate the robustness of the measurement model and demonstrate that the constructs were effectively defined for the South African UoTs' context. The ideal alignment of the two-factor models for BPM and PJSA endorses the perspective that these constructs are fundamentally multidimensional, representing intricate academic processes and job-related experiences (Grisold *et al.,* 2021; Turetken & Van Looy, 2024). This multidimensionality is especially significant in higher education settings, where organisational practices and academic results are influenced by different interconnected factors. Conversely, the adequate fit of single-factor models with correlated errors for DIAP and CRFI indicates that participants viewed digital innovation efforts and BPM-enabling elements more consistently. Even though the RMSEA for DIAP (0.141) exceeds standard cut-off values, recent research cautions against interpreting RMSEA in isolation from other factors. The overall model fit is defensible when supported by additional fit indices, like CFI and SRMR, which stay within acceptable limits (Hu & Bentler, 1999; Hair *et al.,* 2024; Sathyanarayana & Mohanasundaram, 2024). Together, these results validate the theoretical consistency and statistical strength of the constructs, supporting their inclusion in the structural model for additional analysis.

Proposed structural model

This section details the evaluation of the structural model by examining the relationship between the primary latent constructs, employing

SEM with AMOS. The model examines the relationship between BPM, DIAP and CRFI in PJSA. BPM was assessed through two separate dimensions: BPM1 (awareness and implementation) and BPM2 (process improvement initiatives). The following Figure 2 presents a proposed structural model showing relationships between the constructs.

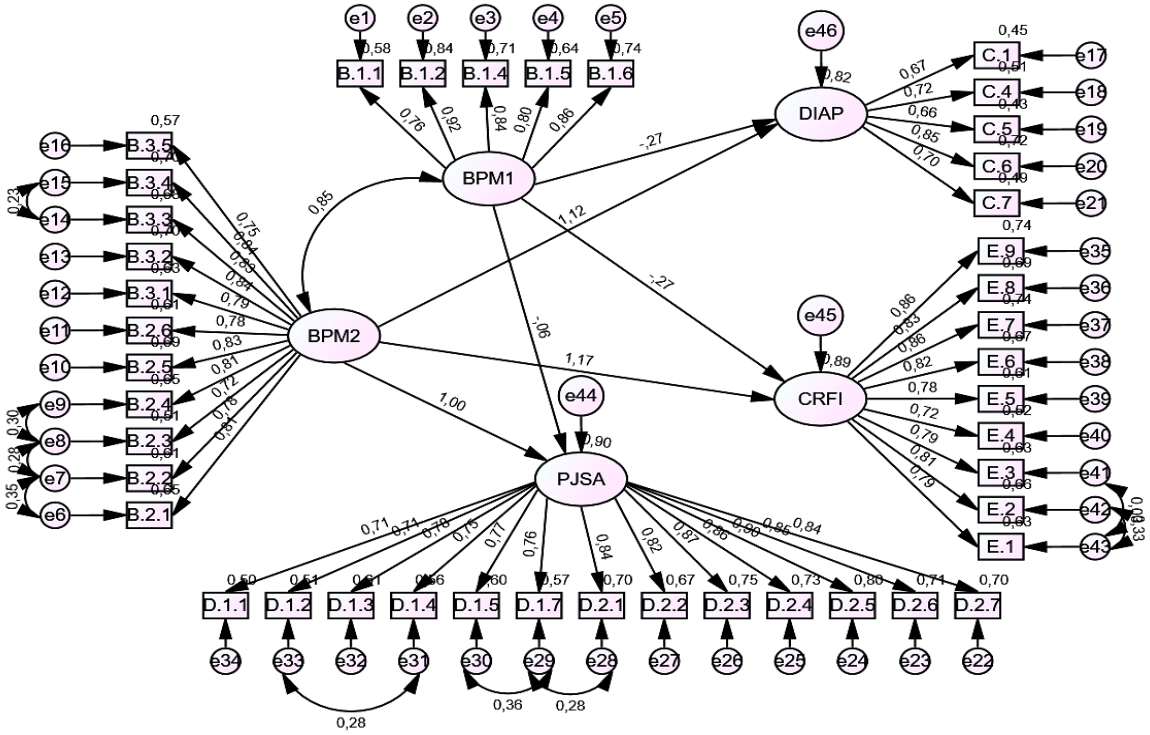

Figure 2: A structural model depicting the relationship between BPM, DIAP, CRFI and PJSA *(Authors' own field data, 2025)*

The results show that BPM2 had a major positive impact on PJSA (β of 0.973, $p < 0.001$), implying that ongoing process improvement enhances academic productivity and satisfaction. On the other hand, BPM1 showed a negative but statistically significant effect on PJSA (β of -0.030, $p < 0.001$), suggesting that a lack of awareness or disjointed BPM implementation, without continuous improvement, might not meaningfully enhance academic results.

Moreover, BPM2 demonstrated considerable positive impacts on DIAP (β of 1.085, $p < 0.001$) and CRFI (β of 1.132, $p < 0.001$), emphasising its contribution to encouraging innovation and institutional preparedness. Conversely, BPM1 exhibited negative correlations with DIAP (β of -0.232, $p < 0.001$) and CRFI (β of -0.234, $p < 0.001$), suggesting that disjointed BPM efforts might obstruct innovation and diminish the efficacy of supportive institutional elements.

The structural model explained 78% of the variance in PJSA (R^2 of 0.78), emphasising the significance of process enhancement, innovation facilitation and synchronised institutional practices in improving academic work environments. These results align with recent studies indicating that advantages of BPM in performance occur solely when combined with innovation and backed by flexible institutional cultures (Kocak & Pawlowski, 2023; Kaganer, Gregory & Sarker, 2023).

Structural relationships and regression weights

To assess the strength of the relationships between the main constructs, standard regression weights were analysed utilising AMOS SEM as depicted in Table 5 below. The results indicate strong and statistically significant connections between BPM2 (process improvement) and PJSA (β of 0.973, $p < 0.001$), DIAP (β of 1.085, $p < 0.001$) and CRFI (β of 1.132, $p < 0.001$). In contrast, BPM1 (awareness/implementation)

showed adverse effects on PJSA (β of -0.030, $p < 0.001$), DIAP (β of -0.232) and CRFI (β of -0.234), suggesting that the partial adoption of BPM without strategic alignment may hinder innovation and organisational support.

Table 5: Key regression weights

Structural Path	Estimate (B)	*P*-value
PJSA ← BPM2	0.973	***
PJSA ← BPM1	-0.030	***
DIAP ← BPM2	1.085	***
DIAP ← BPM1	-0.232	***
CRFI ← BPM2	1.132	***
CRFI ← BPM1	-0.234	***

Source: (Authors' own field data, 2025). All paths significant at $p < 0.001$.

The differing impacts of BPM1 (awareness and implementation) compared to BPM2 (process improvement initiatives) revealed here are crucial for the conceptual framework. The adverse effects of BPM1 indicate that superficial or disjointed BPM initiatives could lead to employee pushback, misunderstanding, or inconsistency, particularly in intricate educational environments (Syed Ibrahim *et al.,* 2019). This observation supports the idea that simple awareness lacking strategic depth may be detrimental. Conversely, the significant positive impact of BPM2 on innovation and job satisfaction pathways corresponds with research supporting the transformative potential of process maturity: when BPM is implemented through continuous improvement cycles, it enhances innovation, engagement, and organisational flexibility (Ahmad & Van Looy, 2020; Malinova, Gross & Mendling, 2022). Collectively, these findings support the study's theoretical claim that only BPM initiatives that focus on process enhancement, rather than mere awareness, effectively facilitate digital transformation and improve academic staff productivity in universities of technology.

Discussion

This study offers essential perspectives on the impact of BPM and digital innovation on productivity and job satisfaction in South African UoTs. Based on the JD-R model and SST, the findings indicate that academic outcomes are enhanced the most when BPM is implemented strategically, supported by institutions, and integrated digitally. The structural model indicated that BPM focused on process improvement (BPM2) had a significant positive impact on productivity and satisfaction of academics (β = 0.973, $p < 0.001$), aligning with evidence that structured and continuous process improvements like simplified curriculum approvals and automated evaluations lessen administrative loads and boost academics' productivity (Tapia *et al.,* 2023; Santos & Trigo, 2025).

Conversely, BPM awareness and disjointed implementation (BPM1) resulted in statistically significant yet detrimental impacts on both productivity (β = -0.030, $p < 0.001$) and the adoption of digital innovation (β = -0.232, $p < 0.001$), confirming earlier concerns that uncoordinated BPM efforts can lead to resistance, confusion or inefficiencies (Distel *et al.,* 2023). These findings highlight the danger of superficial BPM implementation that fails to align with academic priorities or technological frameworks. In contrast, the model indicated that BPM2 significantly promoted the establishment of institutional conditions favourable to innovation (CRFI, β = 1.132, $p < 0.001$), whereas BPM1 weakened these facilitators (β = -0.234, $p < 0.001$). This validates that effective BPM needs to enhance both technical and social frameworks with commitment from leadership, collaboration, and resource distribution rather than depend exclusively on procedural modifications (Legemaate *et al.,* 2022; Kocak & Pawlowski, 2023).

Overall, the structural model accounted for 78% of the variance in productivity and job satisfaction (R^2 = 0.78), confirming that continuous process improvements, digital integration, and institutional readiness create a strong combination for academic advancement. These results strengthen the latest assertions that the effectiveness of BPM in higher education relies not solely on the design of technical systems but also on integrating these systems into academic culture and support structures within institutions (Kelder *et al.,* 2025; Bravo-Jaico *et al.,* 2025).

Limitations

This study concentrated solely on permanent academic staff at two UoTs in South Africa. Contractual or temporary academic staff were omitted because their limited presence in the institution created risks for consistent responses and dependable follow-ups. Shibayama (2022) notes that reliance on temporary academic staff may result in instability in long-term or institutional research involvement.

Recommendations

Based on the results from the structural and measurement models, this study recommends that South African UoTs implement BPM as a strategic tool for improving academic innovation, productivity and job satisfaction. First, BPM needs to be integrated into institutional strategic planning to ensure that academic processes are in line with performance goals. Scorecards and performance agreements should be used to keep track of new ideas on a regular basis. Moreover, strong leadership support is essential for advancing digital innovation and securing investments in technologies that alleviate academic pressures and enhance knowledge sharing. Third, developing capabilities is essential: academic leaders like HoDs and Deans need targeted BPM training, backed by cross-functional teams responsible for reengineering processes in teaching, learning, administration, and community engagements. Ultimately, job satisfaction can be enhanced by systems thinking methods that address administrative barriers and cultivate a more adaptable institutional atmosphere, thereby promoting retention and well-being among academics.

Conclusion

This research adds to the JD-R and SST frameworks by applying them to BPM within higher education and by providing a customised BPM framework for South African UoTs. It offers empirical insights into how BPM practices alongside digital innovation affect academics' productivity and job satisfaction, while also presenting a practical framework for institutional leaders to harmonise efficiency, innovation and academic staff well-being.

This research examined the relationships between BPM, digital innovation in educational processes and levels of job satisfaction and productivity in academia through a structural equation modelling method. The results indicated that BPM significantly and positively affects both digital innovation and academic staff productivity, while essential implementation factors influence these relationships. The empirical data emphasised the importance of BPM as a transformative model for improving operational efficiency, academic success and institutional agility at UoTs.

Despite limitations in sample diversity and difficulties in data collection, the suggested model represents a preliminary move toward a context-aware BPM framework tailored for South African UoTs. Future studies need to expand the sample's diversity and explore the enduring impacts of BPM-driven changes on academic motivation, teaching innovation, and institutional efficiency.

Disclosures

Conflict of interest

The authors declare no competing interests. All authors materially contributed to the research and approved the final version of the manuscript.

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