

The impact on organizational innovation and university performance: The mediating role on employee performance of private universities in Mogadishu



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ABSTRACT

Scholarly research shows that in traditional business settings, organizational innovation and employee performance greatly improve the performance of universities. Globalization has caused major changes in the environment, creating many challenges that require new organizational approaches. The researchers wanted to explore whether this effect could also be found in the academic sector. Therefore, the main goal of this article was to conduct an empirical study to examine this issue. The study used a quantitative method, collecting data through an electronic structured questionnaire. A random sample of 120 academic staff from private universities in Mogadishu, Somalia, was selected for the survey. The data was analyzed using SPSS v23 software and SmartPLS 4. The results show a strong positive relationship between product innovation and both employee and university performance. Process innovation had a significant impact on university performance but negatively affected employee performance. Overall, the study found that employee performance negatively affected the relationship between organizational innovation and university performance. Despite its limitations, this study provides valuable insights for scholars, researchers, and policymakers in academic institutions.

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1. Introduction

Innovation research, introduced by Schumpeter (1911), involves combining economic, technological, organizational, political, cultural, and social factors to improve product and process domains, focusing on the correlation between technological advancements and economic progress (Damanpour and Aravind, 2012). Organizational innovation, introduced by Daft in 1978, differs from corporate innovation due to the hierarchical position of managers and workers (Alves et al., 2018). Innovation is crucial for organizations to adapt to evolving institutional environments, a growing academic field in recent decades (Musyoka and Henry, 2023). African countries should focus on innovation to restructure their systems and enable universities to lead economic change, using product and process innovation to improve performance (Al-

Husseini and Elbeltagi, 2013). Nevertheless, there is a need for more scholarly literature elucidating the organizational innovation strategies used by institutions in developing nations, with a specific focus on those operating within the context of Somalia. Globalization necessitates higher product quality and service standards in various sectors, necessitating adaptation by business and university executives (Sutanto, 2017; Musyoka and Henry, 2023). Educational institutions must engage stakeholders in innovative teaching and learning settings for societal survival and growth (Ngoc-Tan, 2020). Innovation is crucial for organizations to adapt to globalization's changing client needs and lifestyles, while its impact on collective performance is still being studied (Kasim and Noh, 2012). In higher education institutions, innovation is seen as a means to generate new economic opportunities and mitigate risks (Suhag et al., 2017; Musyoka and Henry, 2023). Higher education is vital for a nation's progress, fostering knowledge and change, producing graduates embodying education, research, and community service, and generating valuable knowledge and technology (Sutanto, 2017; Ngoc-Tan, 2020). Higher education significantly affects industrial growth by empowering individuals to use their skills and actively participate in development

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(Ali et al., 2022). The scholarly interest in innovation is increasing, especially in competitive businesses (Saki et al., 2013). It emphasizes the need for organizations to efficiently utilize resources and procedures to achieve desired outcomes (Ngoc-Tan, 2020). Higher education is vital for modern civilization's training, research, and service, and institutions must meet high standards (Ali et al., 2022). Innovation-focused organizations succeed, with universities prioritizing theoretical frameworks, instructional methodologies, curriculum development, pedagogical approaches, policy formulation, technological integration, institutional structures, administrative practices, and educator professional development (Saki et al., 2013; Ngoc-Tan, 2020; Alnatsheh et al., 2023).

Innovation is crucial for organizational success, fostering value creation and competitiveness (Kasim and Noh, 2012). Education innovations, characterized by creativity, quality, originality, and flexibility, significantly impact performance and efficiency (Ngoc-Tan, 2020). Universities should cultivate entrepreneurial graduates, promoting national culture and residential services (Sutanto, 2017). Academic institutions promote innovative thinking through scholarly publications and industry consultation (Alnatsheh et al., 2023). The global education sector faces increased competition, leading to corporate management approaches requiring external responsibility (Kasim and Noh, 2012). Universities that consistently improve their service delivery models are more likely to achieve global competitiveness (Musyoka and Henry, 2023).

Universities in Europe, the US, and Japan are enhancing research and development. However, assessing and measuring organizational innovation in sub-Saharan African universities requires further development, highlighting a relatively underexplored area of academic literature (Uche and Continue, 2015; Suhag et al., 2017). African and Asian nations face limited accessibility, quality improvement, commercialization concerns, professional development opportunities, and a standardized curriculum (Jama et al., 2023). Government support is needed for growth, and private universities must prioritize performance and innovation for global competitiveness (Ali et al., 2022). African universities need more budget constraints and resistance to innovation (Kasim and Noh, 2012; Musyoka and Henry, 2023).

Somalia's education system needs improvement due to insufficient higher education, resulting in fewer graduates with suboptimal qualifications (Jama et al., 2023). The country faces a significant unemployment problem, with a 54% overall and a 75% young unemployment rate. Private universities in Mogadishu need help with teaching capacity, administrative personnel, learning materials availability, and skilled academic staff. More research and publishing are also needed to address these issues. The study examines the impact of organizational innovations on the performance of private universities in Mogadishu, focusing on

product and process innovations implemented at 62 institutions. It highlights the need for further research on the correlation between organizational innovations and university and employee performances, highlighting the need for further scholarly investigation.

The research seeks to examine the association between organizational innovation and the performance of universities and employees in Mogadishu-based private institutions, with specific goals aligned with the study's primary purpose. The enumerated goals are as follows:

1. This study examines the correlation between product and process innovations and the performance of private universities in Mogadishu.
2. This study examines the association between product and process innovations and employee performance within the context of private universities in Mogadishu.
3. This study examines the indirect link between product and process innovations, employee performance, and university performance at private institutions in Mogadishu.

2. Literature review

Innovation, originating from the Latin verb "innovate," refers to creating new ideas or improvements in existing products or services. Schumpeter introduced innovation in 1934 (Damanpour and Aravind, 2012). Some researchers argue that innovation stems from individual and group creativity (Alnatsheh et al., 2023). Innovation is the application of new technical and performing knowledge to create new products and services for clients, a concept that is subject to debate, especially in academic circles (Alves et al., 2018; Sutanto, 2017).

Organizational innovation involves developing and implementing innovative strategies for managing corporate operations, including production, R&D, and human resource management (Damanpour and Aravind, 2012). It aims to improve performance and competitiveness, minimize environmental impacts, and achieve sustainable goals (Uche and Continue, 2015). It is integrating new ideas, methods, brands, processes, services, or policies into an organization's operations (Suhag et al., 2017; Ngoc-Tan, 2020; Alnatsheh et al., 2023).

Innovation is crucial for organizations to generate value and maintain competitive advantages in a complex and changing environment (Saki et al., 2013). It drives business expansion, creates new products or services, and keeps pace with technological advancements (Alnatsheh et al., 2023). Organizational innovation involves implementing new methods in industry practices, workplace operations, and external relationships, such as outsourcing, partnerships, subcontracts, quality management, reengineering, and lean management (Suhag et al., 2017). Prioritizing innovation increases the likelihood of success (Alnatsheh et al., 2023).

Innovation involves product, process, and organization aspects (Suhag et al., 2017). Successful implementation requires a comprehensive approach considering variables, attributes, and contributions to organizational performance (Saki et al., 2013). Eight forms of innovation are identified: Process, Product, Incremental, Radical, Administrative, Technology, Market, and Value (Ngoc-Tan, 2020).

Kasim and Noh's (2012) study identified five dimensions of organizational innovativeness: creativity, receptiveness to novel concepts, aspiration for innovation, willingness to take risks, and technical proficiency. Sutanto's (2017) study evaluated organizational innovation, including ideas, behaviors, products, academic procedures, technology, and administrative practices (Ngoc-Tan, 2020). Technical innovations focus on improving goods and services, with product and process innovations primarily focusing on manufacturing with less attention given to other sectors (Damanpour and Aravind, 2012).

Higher education institutions innovate by developing new teaching methods, programs, and research initiatives, known as innovative products and processes (Ali et al., 2022). Research focuses on organizational effectiveness and the need for universities to adapt these aspects to enhance educational performance and quality (Al-Husseini and Elbeltagi, 2013). This study investigates organizational innovation by analyzing both product and process innovations.

Process innovation is creating, implementing, and transforming fundamental aspects of an organization to improve the creation or delivery of goods or services (Kasim and Noh, 2012; Damanpour and Aravind, 2012). It involves individuals collaborating to enhance delivery systems, reduce resource input, and improve eco-efficiency (Saki et al., 2013). This strategic approach helps businesses create unique products or services that set them apart, providing a competitive edge (Suhag et al., 2017). It also helps businesses reduce costs and offer additional benefits from a product and process standpoint (Ngoc-Tan, 2020). In this study, the operationalization of process innovation includes implementing many strategies, including new training programs, incentive systems, new technology, reward systems, and teamwork and relationships.

Product innovations are products or services designed to meet user needs (Damanpour and Aravind, 2012; Saki et al., 2013). They are a systematic process that involves creating and delivering enhanced products or services, often introducing pioneering services (Uche and Continue, 2015; Musyoka and Henry, 2023). This process involves various stages, including design, research, development, administration, and market marketing, resulting in redesigned or significantly enhanced products or services (Suhag et al., 2017).

Product innovation is creating or designing new goods within an organization (Kasim and Noh, 2012). Higher education institutions' global competitiveness relies on their ability to innovate

products, which enhances service efficiency (Musyoka and Henry, 2023). This is crucial for government organizations like universities, as it aids business advancement and effectiveness (Suhag et al., 2017). Innovative products in higher education, such as automation, computer skills education, digitization of records, technology integration, and financial services, are widely considered to enhance university goals (Musyoka and Henry, 2023). This study focuses on implementing product innovation strategies, including introducing new academic programs, research projects, publications, course development, creation of teaching materials, and curriculum revision.

In the 1950s, performance assessment focused on work, people, and organizational structure, defining university performance as achieving goals within a social system (Ngoc-Tan, 2020). Resource utilization efficiency was included in the 1960s and 1970s (Kasim and Noh, 2012). Private university performance includes subjective evaluations by rivals and internal assessments (Kasim and Noh, 2012). University performance is crucial for management research (Suhag et al., 2017).

Different writers define university performance differently, focusing on intangible factors like education quality, operational efficiency, efficacy, global engagement, and influence on the community and industry (Ngoc-Tan, 2020). University performance assessment is crucial for organizations and academics and for addressing concerns from government entities and stakeholders (Abubakar et al., 2018). Abubakar et al. (2018) discussed various methods for evaluating university performance, including financial and non-financial indicators. The Balanced Scorecard assesses performance in four key areas: region and consumers, funding, internal processes, and learning (Ngoc-Tan, 2020). Non-financial metrics like market performance and customer satisfaction can provide valuable insights into organizational effectiveness (Suhag et al., 2017). The US government evaluates educational institutions to improve their performance, focusing on leadership, strategic planning, student and stakeholder focus, information analysis, staff focus, educational process management, and course performance outcomes (Ngoc-Tan, 2020).

Higher institution performance measurement studies are limited, primarily focusing on research, teaching, project income, and student satisfaction. At the same time, academic indicators like reputation, employability, faculty ratio, Nobel Prize, and field medals need more research (Abubakar et al., 2018). The study uses Abubakar et al.'s (2018) framework to analyze university performance, considering six variables: Academic reputation, employability of graduates, faculty-to-student ratio, publications, academic resources, infrastructure, and consulting services. Organizational innovation is crucial for higher education institutions' performance and competitive advantage (Ali et al., 2022). It promotes environmental adaptability, internal process efficiency, institutional prestige, and financial

benefits (Saki et al., 2013). Studies show that implementing innovative strategies significantly affects overall performance (Ngoc-Tan, 2020). The relationship between organizational innovation variables and performance is crucial for university success in highly competitive environments (Sutanto, 2017). Durable competitive advantages are essential for organizations to achieve their goals (Kasim and Noh, 2012).

The study reveals a significant correlation between organizational innovativeness and university performance, suggesting that innovative activities can offer a competitive edge and significantly enhance success in Higher Education Institutions (Kasim and Noh, 2012). The study reveals that product innovation significantly influences institutions' awareness, vulnerability, and adaptive capability (Uche and Continue, 2015). The study reveals a strong correlation between product, process, and organizational innovation, highlighting the importance of innovation in enhancing organizational performance (Suhag et al., 2017). Innovation is strongly linked to organizational performance, a relationship seldom studied, especially in academia (Ngoc-Tan, 2020).

Research indicates a significant correlation between product innovations and university performance, suggesting that product enhancements may accurately explain university performance and should be prioritized in product development (Musyoka and Henry, 2023). According to the previous research, there is a favorable correlation between organizational innovation and performance. Based on the conceptual framework shown in Fig. 1, the study proposes the following central hypothesis:

H1. A significant correlation exists between organizational innovation and university performance in private universities located in Mogadishu.

Employee performance is a subjective evaluation of an employee's work obligations, focusing on the quality and quantity of work completed on assigned tasks and their contribution to achieving organizational objectives (Abdullahi et al., 2022). Both quantitative and qualitative factors influence it. This research uses the Williams and Anderson (1991) framework, incorporating three elements: overall performance level, task completion, and competence. Performance, derived from job accomplishment, is crucial for achieving desired results and organizational goals (Astrama et al., 2020). It is essential for employee behavior research, organizational success, and educational quality (Adenekan Tolulope, 2017). Effective staff performance is vital for developing the educational system and long-term company viability, as workers are a critical asset for advancement and success (Abdullahi et al., 2022).

Firms must prioritize workforce commitment and foster a supportive environment to promote creative work behavior (Awan and Javed, 2015).

Employees significantly affect a company's success, highlighting the need for substantial investment in staff development for growth (Astrama et al., 2020).

Awan and Javed (2015) found that various forms of innovation positively impact employee performance, with staff innovation being the most influential factor. Adenekan Tolulope (2017) found a positive correlation between staff creativity and performance. Astrama et al. (2020) found that elevated levels of innovative work behavior correlate with enhanced employee performance.

Adenekan Tolulope (2017) distinguished between micro-level and macro-level perspectives on employee job performance, focusing on individual behaviors and their impact and productivity and effectiveness resulting from these behaviors. This research uses a macro-level approach to examine the connection between organizational innovation and employee performance. After thoroughly analyzing the relevant theoretical literature, this study presents the following research hypothesis:

H2: Implementing organizational innovation has been shown to influence employee performance positively.

Employee performance is efficiently completing tasks within a specific timeframe to meet work standards, goals, or criteria (Izzah et al., 2020; Astrama et al., 2020). It is crucial for a business's long-term success and advancement, as workers are the primary resource (Abdullahi et al., 2022). It influences organizational behavior research, productivity, system development, and educational quality (Adenekan Tolulope, 2017). Work quality, job knowledge, collaboration, reliability, initiative, and competence contribute to overall success and progress (Kareem and Hussein, 2019).

Studies show that employee performance is crucial for a firm's success, emphasizing the need for investment in staff development (Astrama et al., 2020). Employee behavior impacts creativity and overall performance and is influenced by human resource policy. Organizations should promote innovative work behavior (Awan and Javed, 2015). The decline in educational performance necessitates the investigation of potential academic performance variances due to decreased staff performance (Adenekan Tolulope, 2017).

Based on extensive theoretical literature analysis, the study examines the mediating effect of employee performance on the relationship between organizational innovation and university performance. The present study formulates the following research hypothesis:

H3: The positive association between organizational innovation and university performance is mediated by employee performance.

3. Theoretical framework

The research will use the Resource Dependence Theory, first proposed by Barney (1991), to

understand how institutions can maintain their competitive edge in uncertain situations. The theory suggests that organizations can use their resources, including physical and intangible assets, to enhance performance (Musyoka and Henry, 2023). This can be achieved through implementing organizational innovation strategies, such as product innovation, novel initiatives, and automation of services and processes. The variables examined in this study are closely related to the theory, demonstrating its relevance to the study.

3.1. Conceptual framework

After thoroughly analyzing the papers above, the researchers have developed a conceptual framework with promise for validation via empirical study. The existence of a link between organizational innovations and the performances of universities

and employees has been shown via empirical study. The research on the nature of the relationship, whether it is characterized by positivity or negativity, emerges. Fig. 1 depicts the previously described connection and aims to determine if it demonstrates a positive or negative association. The following conceptual research paradigm was used in this study.

4. Methodology

This section outlines the research methodology, study population, and sampling strategies, ensuring data reliability through appropriate data types, sources, and collection strategies. Variables are assessed using statistical software like SPSS and SmartPLS, and results are tabular, including demographic data, measurement details, and structural results.

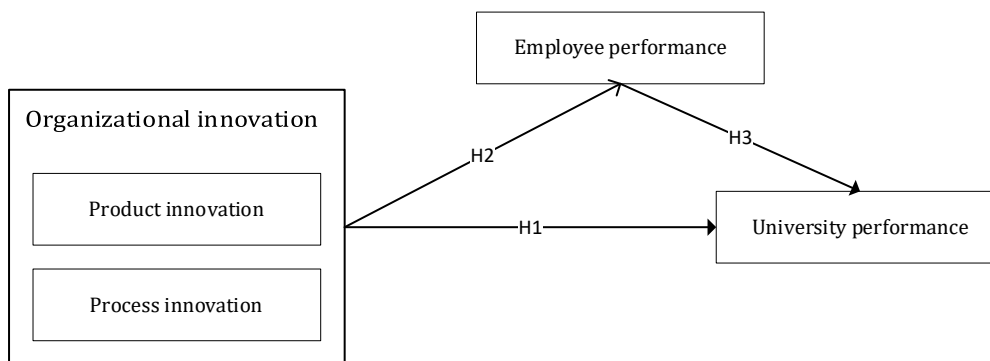


Fig. 1: Research model

The study employs a quantitative methodology and deductive approach to examine the link between organizational innovation, employee performance, and university performance, utilizing the positivist paradigm and resource dependence theory to ensure generalizability across the entire population. The study utilized an explanatory research approach to examine the impact of organizational innovation on employee and university performance, utilizing hypothesis testing and empirical evidence to support or refute these assertions, with the primary goal of explaining observed phenomena (Neuman, 2014; Saunders et al., 2007).

4.1. Target population, sample size, and sampling

The study examines the impact of organizational innovation on the performance of employees and universities at private universities in Mogadishu. The 1991 Somali government dissolution led to a civil war, influencing higher education. In 1999, the Mogadishu higher education system resurgence was facilitated by local communities, diasporas, religious groups, and foreign organizations. Mogadishu has a single state-owned university and 59 privately owned ones. Researchers selected eleven from 59 based on student and faculty populations, student-to-lecturer ratio, research publications, and early establishment. The number of lecturers varies

among universities, with 2,501 total, with selected universities employing 342. The survey targeted 342 workers from various institutions based on a selection process. The sample size for research activities was 181, following the guidelines provided by Krejcie and Morgan (1970). To ensure fair access, the study utilized a random sample method to select participants from private Mogadishu institutions, including administrative personnel and instructors. Simple random sampling offers fair and impartial analysis, ensuring accurate representation and precise depiction of the broader sample due to its equitable and random selection (Saunders et al., 2007).

4.2. Method of data collection and measurement instrument

This study-utilized questionnaire was distributed to Mogadishu's senate and faculty members, with 120 participants. Secondary data was sourced from reputable scholarly sources, including academic journals, publications, and reports from esteemed institutions. The study used a validated survey questionnaire with primary constructs from prior research and selected questions based on their validity and reliability. Measurement scales included thirteen organizational innovation items from Al-Husseini and Elbeltagi (2013), nine items on

university performance from [Abubakar et al. \(2018\)](#), and seven questions on employee performance from [Murphy's \(2014\)](#) study. All items were rated using a five-point Likert scale with 34 questions.

4.3. Data analysis and ethical considerations

The study utilized descriptive and inferential statistical methods to analyze participants' demographic characteristics. SPSS version 23 was used for preliminary data analysis and data screening, while SmartPLS version 4 was used for validation. The researchers employed measurement and structural model techniques to analyze the data. PLS is used in social science, business, and management research to handle complex models with small sample sizes ([Hair et al., 2022](#)). It enhances data validity and reliability, improving outcome validation ([Hair et al., 2022](#)). It has been used in recent research to examine mediators. The study prioritized ethical considerations and maintained confidentiality throughout data collection, management, and analysis. Participants were informed of the study's goals, objectives, and importance before consenting, and researchers thanked responders after completion.

5. Results

The study collected demographic data using five criteria, with gender being the first demographic characteristic examined. The study found that 111 out of 120 participants self-identified as male, with the remaining nine female. This trend suggests a national-level issue causing uneven representation of men in the workforce, possibly due to various national factors. The study found that 47 out of 120 participants were under 30, with the remaining 60 aged between 30 and 39. This indicates a significant

proportion of participants are between 30 and 39 years old, indicating a millennial generation with birthdates after 1980. The majority of participants were aged between 30 and 39. The study reveals that among the 120 participants, 79 had less than ten years of work experience, 34 had 10-19 years, six had 20-29 years, and one had over 30 years. The results suggest that the knowledge level of participants attending private universities in Mogadishu has increased.

The study found that out of 120 participants, 96 have a master's degree, 12 have a bachelor's degree, 11 hold a doctorate, and one has a diploma. The findings suggest that diploma holders have limited access to quality higher education and would benefit from increased Ph.D. holders in Mogadishu private colleges. The demographic data reveals that out of 120 participants, 106 are permanent employees, while 14 are part-time employees, indicating a need for more part-time instructors in these institutions.

5.1. Model fit analysis

Researchers assessed the structural model's fit before analyzing it using [Henseler et al.'s \(2015\)](#) four model-fitting parameters: SRMR, d-ULS, d-G, and NFI. The study employs SRMR to compare observed and predicted correlation matrices, with a value below 0.096 indicating satisfactory results, meeting the acceptable threshold ([Hair et al., 2022](#)). The study utilized d-ULS and d-G to calculate discrepancies, with both indicating acceptability based on statistical significance $p > .05$. The study utilized the Normed Fit Index (NFI) to assess the model's overall fit, indicating a satisfactory level when the NFI surpasses .90 ([Hair et al., 2022](#)). The analysis in [Table 1](#) indicates a satisfactory fit for the model.

Table1: Model fit

Parameter model	SRMR	d-ULS	d-G	NFI
Recommended value	< .10	> .05	> .05	> .90
Research findings	0.080	2.296	0.959	0.990

d-ULS: Unweighted least squares discrepancy; d-G: Geodesic discrepancy

5.2. The measurement model

The measurement model assesses construct quality, validity, and reliability, examining factors loadings, average variance extract, composite reliability, discriminant validity, and Variance Inflation Factor (VIF) for multicollinearity identification. The study's findings are presented in [Tables 2 and 3](#). Confirmatory factor analysis (CFA) is a method used to assess items associated with constructs, removing items with lower factor loadings to meet the appropriate threshold for average variance extracted (AVE) and composite reliability.

The threshold for factor loading is above 0.6, and all levels between 0.638 and 0.872 are suitable, aligning with the propositions proposed by [Chin \(1998\)](#) and [Hair et al. \(2022\)](#). The composite

reliabilities, which must exceed a threshold of 0.7, were measured and found to be within a reasonable range, with all variables exceeding the specified standards by a margin of 0.7 ([Hair et al., 2022](#)). The AVE must exceed 0.5, and every measure's AVE values ranged between 0.523 and 0.629, a reasonable range consistent with [Hair et al. \(2022\)](#) assertions. The study used two methodologies to evaluate the discriminant validity, as detailed in [Table 2](#).

The construct validity was assessed using the PLS-SEM approach, evaluating both convergent and discriminant validity. Convergent validity was demonstrated using AVE and factor loading methodologies, as shown in [Table 1](#). Discriminant validity is assessed by calculating the square root of a latent variable's AVE, which should exceed the correlations with other variables ([Hair et al., 2022](#)).

There are two approaches for assessing the discriminant validity of partial least squares (PLS) analysis: Fornell-Larcker and Heterotrait Monotrait Ratio (HTMT) (Chin, 1998). The Fornell-Larcker criterion and the Heterotrait Monotrait Ratio (HTMT) are shown in Tables 3 and 4.

The literature establishes a basis for assessing discriminant validity, suggesting that the square root of the average variance for each latent variable should exceed observed correlations (Hair et al., 2022). Table 3 demonstrates the study's results with a high level of discriminant validity.

Table 2: Constructs loadings, Composite reliability, AVE, and VIF for multicollinearity

Variables	Indicators	Loading	Composite reliability	AVE	VIF
Product innovation	ProductInno01	0.658	0.866	0.566	1.392
	ProductInno02	0.748			1.593
	ProductInno03	0.681			1.393
	ProductInno04	0.815			2.009
	ProductInno05	0.842			2.131
Process innovation	ProveInno01	0.763	0.918	0.583	2.200
	ProveInno02	0.792			2.343
	ProveInno03	0.844			3.028
	ProveInno04	0.765			2.217
	ProveInno05	0.761			1.906
	ProveInno06	0.716			1.717
	ProveInno07	0.713			1.798
	ProveInno08	0.743			2.140
Employee performance	EmployeePer01	0.739	0.893	0.629	1.532
	EmployeePer02	0.638			1.375
	EmployeePer03	0.832			2.793
	EmployeePer04	0.859			2.530
	EmployeePer05	0.872			3.019
University performance	UniversityPer01	0.638	0.884	0.523	3.136
	UniversityPer02	0.828			1.691
	UniversityPer03	0.668			2.790
	UniversityPer04	0.750			1.939
	UniversityPer05	0.685			1.293
	UniversityPer06	0.691			1.563
	UniversityPer07	0.785			1.903

Table 3: Fornell-Larcker criterion

Variables	Employee performance	Process innovation	Product innovation	University performance
Employee performance	0.793			
Process innovation	0.361	0.763		
Product innovation	0.469	0.760	0.753	
University performance	0.350	0.651	0.643	0.723

The HTMT ratio test was utilized to assess discriminant validity, suggesting that results should remain below the predetermined threshold of 0.90 (Hair et al., 2022). The research findings confirm the

model's discriminant validity, as evidenced by Table 4, indicating that the requirements for this validity have been met.

Table 4: Heterotrait Monotrait ratio

Variables	Employee performance	Process innovation	Product innovation	University performance
Employee performance				
Process innovation	0.402			
Product innovation	0.549	0.893		
University performance	0.425	0.741	0.759	

5.3. Structural model

The final step involves evaluating the structural model after completing the measurement model analysis and achieving satisfactory outcomes. PLS-SEM 5000 bootstrapping was used to measure the statistical significance of the correlations (Hair et al., 2022). The research utilized various methods, such as evaluating collinearity among components, computing the coefficient of determination (R²), and evaluating effect size (F²). The following sections will include comprehensive details about each step previously alluded to.

The structural model was evaluated for multicollinearity concerns, and all inner VIF values were below the threshold of five. This indicates no collinearity issues in the model, allowing researchers to proceed with assessing it. The results align with

Vinzi et al.'s (2010) recommendations, and the collinearity diagnostics are presented in Table 2.

The R-Square (R²) value is utilized to determine the coefficient of determination and evaluate the variability in the impact of the independent variable on the dependent variable (Hair et al., 2022). Falk and Miller (1992) suggested that R² values of 0.10 or higher are sufficient for a particular endogenous construct's variance explanation to be considered adequate. The outcomes of the measurement conducted in this study, using the coefficient of determination (R²), are shown in Table 5. Table 5 shows that the R-Square values for employee and university performance variables are 0.219 and 0.527, respectively. The results of this study indicate that around 21.9% of the variance in employee performance may be explained by innovation behaviors, including both product and process

innovation. The two components of innovation explain 52.7% of the variance in university performance. The research findings are consistent with the suggestions by Falk and Miller (1992).

The effect size (F2) is a statistical tool used to assess the impact of excluding certain constructs from a model on the R2 value, determining its

significant impact on the endogenous structure (Hair et al., 2022). The f-square values of .02, .15, and .35 indicate small, medium, and significant effects, respectively. Table 4 displays the F2 values. The results of the assessment performed in this research, utilizing the F2 Evaluation, are presented in Table 6.

Table 5: The coefficient of determination (R2)

Variables	R ²	R ² Adjusted
Employee performance	0.219	0.206
University performance	0.527	0.515

Table 6: F2 evaluation

Variables	Employee performance	Effect size	University performance	Effect size
Employee performance			0.040	Small
Process innovation	0.000	Small	0.106	Medium
Product innovation	0.117	Medium	0.088	Small

The current research findings indicate that process innovation has a minimal impact size (F2=0.00) on employee performance. The impact of process innovation on university performance is moderate, as shown by the effect size of f2=0.106. The results of the present study suggest that a moderate effect size (F2=0.117) exists between product innovation and employee performance. The influence of product innovation on university performance has a negligible effect size of f2=0.088.

The SmartPLS software employs a bootstrapping mechanism to test hypotheses, involving resampling a sample to generate more, resulting in a large number of 5000 resamples from the original sample with replacement. Table 7 displays the t-values and p-values obtained from hypothesis testing on the

model used in this study. The study found a significant correlation between process innovation and employee performance, with p-values of 0.490 (p<0.05). The T-statistics show a value of 0.025, less than the t value of 1.96, indicating that hypothesis (H1) is either invalid or rejected. The study reveals a significant correlation between process innovation and university performance, with p-values of 0.000, confirming the hypothesis.

The research indicates a significant correlation between product innovation and employee performance and university performance, confirming or validating the second hypothesis (H2) (p-values 0.000 and 0.000, respectively; (p<0.05). The study's results are presented in Table 7.

Table 7: Direct effect

Relationship	T-values	P-values	Results
Process innovation > Employee performance	0.025	0.490	Not significant
Process innovation > University performance	3.804	0.000	Significant
Product innovation > Employee performance	3.423	0.000	Significant
Product innovation > University performance	2.958	0.002	Significant

Table 8 presents the findings of the mediation study, which indicates that the dimensions of innovation are associated with university performance indirectly since they are mediated by employee performance. The analysis findings indicate a negative and significant association

between the dimensions of innovation and university performance, as mediated by employee performance (p=0.492, p=0.061, p>0.05; see Table 8 for reference). The study's results are shown in Table 8.

Table 8: Mediating effect

Relationship	T-values	P-values	Results
Process innovation → Employee performance → University performance	0.020	0.492	Not significant
Product innovation → Employee performance → University performance	1.544	0.061	Not significant

6. Discussion

The study results indicate that implementing process innovation significantly influences the university's performance. The p-value of 0.000 obtained in this research indicates a statistically significant association between a heightened degree of process innovation and enhanced university performance among private institutions in Mogadishu. Similarities exist between the findings of this study and those of prior studies (Kasim and Noh, 2012; Suhag et al., 2017; Ngoc-Tan, 2020). According

to the results, universities should emphasize process innovation as new technologies are used to enhance work processes and as novel approaches are explored to enhance processes and adapt to the evolving demands of stakeholders. Therefore, H2 was successfully attained in process innovation and the university's performance.

The research outcomes reveal that the execution of process innovation hurt employee performance, as shown by the statistical significance of the p-values (p=0.490, p<0.05). Diverse outcomes arise due to variations in country culture, governance,

organizational practices, and the views held by respondents. The results of the present study need to be more consistent with previous studies (Adenekan Tolulope, 2017; Astrama et al., 2020). Hence, H2 could have achieved more effective attainment in processing innovation and employee performance.

The outcomes of the research indicate that there is a positive relationship between product innovation and the performance of workers as well as the institution. The obtained p-values of 0.000 and 0.002, respectively, provide evidence of statistical significance of the obtained results. The findings of the current study exhibit similarities to prior studies conducted by Uche and Continue (2015), Suhag et al. (2017), and Musyoka and Henry (2023). The results indicate that as universities increase the number of programs or services they offer, they expand and modify their curricula to better cater to the demands of their students. Therefore, the second hypothesis (H2) has been accomplished.

The findings elucidate the mediating function of employee performance. Based on the findings in Table 8, employee performance is a complementing partial mediator in the association between organization innovation characteristics and university performance. This demonstrates that employee performance improvement might depend on organizational innovation dimensions. Furthermore, the findings contribute to the advancement of knowledge regarding the significance of employee performance and demonstrate its potential to undermine the overall performance of universities. The results of this research align with the findings of Samwel's (2018) study, which examined the impact of employee performance on organizational performance in small firms in Tanzania. Samwel's (2018) study concluded that there is a negative and statistically significant relationship between employee performance and organizational performance. The results of the present study diverge from the conclusions made by Kareem and Hussein (2019), who investigated the influence of employee performance on organizational performance within Iraqi institutions. The research findings indicate a robust and statistically significant correlation between employees' performance and the organization's overall success. Different results occur due to differences in national culture, governance, organizational procedures, and the perspectives of the research participants.

7. Conclusions

The findings of this study demonstrate a favorable correlation between the adoption of process innovation and product innovation and the overall performance of universities. This is shown by a statistically significant relationship among these three variables. A favorable correlation exists between the degree to which private universities in Mogadishu participate in process innovation and

product innovation methods and their influence on university performance. Process innovation has a substantial and adverse effect on employee performance. Therefore, introducing process innovation at private universities in Mogadishu would likely decrease employee performance. It is worth noting that product innovation substantially influences employee performance. As a result, the higher the incidence of private universities in Mogadishu that actively participate in assessing employee performance, the more significant the potential for improvement in employee performance. Finally, including employee performance as a mediator was crucial in enhancing university performance and reinforcing the relationship between organizational innovation and university performance.

7.1. Theoretical implications

This study examines the correlation between organizational innovation and academic performance. It confirms several conjectures about the link between three variables in academia and contributes to the literature. The research examines product and process innovation in higher education institutions from two perspectives. It reveals that each type of innovation has a distinct impact on organizational performance. This research contributes to the literature on employee performance as a mediating variable in academia and highlights the effectiveness of organizational innovation as a management tool for improving university performance.

7.2. Managerial implications

This research outlines strategies to improve the performance of academic institutions, providing valuable guidance for administrators. Administrators should increase their awareness of innovation, implement appropriate initiatives, and develop effective policies. To create an innovative Higher Education Institution, administrators should foster a culture of innovation, implement advanced management methods, and leverage information technology for effective governance, learning, teaching, and R&D. Strategies recommended include program revision, social demand-driven disciplines, stakeholder participation, exchange, network construction, and capacity expansion beyond Higher Education Institutions borders. These results are directly relevant to daily operations and can inspire innovation and improved organizational performance.

7.3. Limitations and future of the study

The study's research approach and setting may need to be more generalizable due to its focus on organizational innovations of private universities in Somalia. The respondents and managerial staff may

speak favorably about their organization. To mitigate bias, a qualitative survey should be conducted alongside a quantitative survey. Future research should explore comparative organizational innovation and performance studies across industries or countries. Longitudinal time-series data can better understand the causal relationship between organizational innovation and performance. These directions are strongly suggested for further studies. Future studies might better examine mediating or moderating characteristics, including servant leadership, organizational learning, workplace interaction, human development, organizational culture, and employee motivation, to investigate the connection between organizational innovation and university performance.

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Compliance with ethical standards

Ethical considerations

All participants provided informed consent, and their responses were kept confidential and anonymous. This study was conducted following ethical guidelines approved by SIMAD University.

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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