



Empowering Palestinian universities: the impact of information technology capabilities and strategic planning on entrepreneurial performance

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Abstract

In the ever-changing and dynamic business environment, information technology (IT) capabilities and strategic planning play a pivotal role in shaping the entrepreneurial performance of higher education institutions. This study examines the relationship between IT capabilities, strategic planning, and entrepreneurial performance in Palestinian universities during the ongoing war in Gaza (2023–2024). A descriptive-analytical quantitative approach was employed, and data were collected from 300 participants across different universities through stratified random sampling. Data were gathered between October 2023 and January 2024, during the height of the conflict, using a structured questionnaire whose measures were grounded in established theoretical frameworks. The analysis, conducted using IBM SPSS Amos v26, included descriptive statistics, confirmatory factor analysis, and structural equation modeling. Results revealed a modest but significant direct effect of IT capabilities on entrepreneurial performance ($\beta=0.120, p<0.05$) and a strong mediating role of strategic planning ($\beta=0.876, p<0.001$). The findings underscore the necessity of prioritizing IT investments and embedding proactive strategic planning to counteract severe disruptions caused by war and resource scarcity. By fostering strategic planning, the study provides practical recommendations for policymakers and university leaders, emphasizing the importance of resilience-building, diversification of funding sources, and the adoption of innovative IT-driven educational models.

Keywords Information technology capabilities · Strategic planning · Entrepreneurial performance · Structural equation modeling · Higher education resilience

Introduction

Information technology (IT) technical capabilities refer to an integrated set of skills, resources, and infrastructures that enable organizations to effectively leverage technology to achieve their strategic and operational objectives (Sony et al., 2023). In today's dynamic and competitive environment, these capabilities are crucial for improving operational efficiency (Strange & Zucchella, 2017), fostering innovation (Halpern et al., 2021), and enhancing adaptability to rapid technological and environmental changes (Al-Mamary et al., 2020). Key components of IT capabilities include advanced information systems, robust technical infrastructure, and the technical proficiency of employees (Danilo et al., 2023; Laudon & Laudon, 2022). Empirical evidence consistently demonstrates that strong IT capabilities enhance organizational performance and strengthen the capacity for innovation (Abu Jabara, 2020; Ahmed, 2019).

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Importantly, this study focuses on entrepreneurial performance rather than academic performance because contemporary higher education institutions (HEIs) are no longer assessed solely by teaching quality and scholarly outputs, but also by their “third mission”: translating knowledge into socio-economic value through innovation, knowledge transfer, partnerships, and resource generation. This transformation is captured in the concept of the entrepreneurial university, where universities complement academic excellence with market- and society-facing activities such as technology transfer, industry collaboration, start-up/spin-off support, and regional engagement (Compagnucci & Spigarelli, 2020; et al., 2017; Wooden & Wooden, 2023). In this view, entrepreneurial performance becomes an integrative outcome reflecting an institution’s capacity to (a) mobilize and reconfigure resources, (b) generate innovative outputs, (c) sustain stakeholder value, and (d) diversify revenue streams—capabilities that are particularly decisive when public funding is constrained or disrupted (Gür et al., 2017; Pacheco et al., 2024). This rationale is even more compelling in conflict-affected contexts, where maintaining education continuity may be necessary but insufficient for institutional resilience; universities must also strengthen employability-relevant innovation, external partnerships, and adaptive resource strategies to remain viable and responsive to societal needs under instability (Coelho & da Silva, 2025; Compagnucci & Spigarelli, 2020; United Nations Educational, Scientific and Cultural Organization (UNESCO), 2021, 2024). Therefore, entrepreneurial performance is adopted here as a resilience-sensitive performance lens that complements—not replaces—academic performance, and better aligns with the strategic challenge Palestinian universities face in Gaza: sustaining operations while simultaneously enabling innovation, partnerships, and resource diversification under severe constraints (Abusamra, 2023; Abu Jarad & Naim, 2022; Palestinian Central Bureau of Statistics (PCBS), 2024; United Nations Office for the Coordination of Humanitarian Affairs (OCHA), 2024).

In the Palestinian context—particularly in the Gaza Strip—these capabilities hold even greater significance due to severe resource constraints, logistical barriers, and political instability (Khaled, 2014). Higher education in Palestine faces structural and administrative challenges that require urgent reform to address governance issues and improve institutional identity (Abusamra, 2023). Additionally, geopolitical, socio-economic, and organizational obstacles—such as movement restrictions and governance limitations—continue to hinder the internationalization of Palestinian universities (Koldas & Çıraklı, 2019). To meet the demands of an evolving labor market, universities must modernize their administrative systems, curricula, and admissions policies while diversifying funding sources (Abu Jarad & Naim,

2022). Studies have shown that targeted investment in IT, as exemplified by Al-Quds Open University, can mitigate technological infrastructure weaknesses and funding shortages, thereby enhancing the educational process and achieving institutional goals (Khaled, 2014; Salem, 2020).

Enhanced IT capabilities empower universities to deliver distance education, manage crises, and sustain operations even under adverse conditions (Abu Zeyad & Az-Zain, 2021; Al-Fraihat et al., 2020; Salem, 2020). Empirical evidence from Al-Azhar University in Gaza confirms that adopting e-learning technologies during crises has significantly contributed to educational continuity and improved student performance (Abu Jabara, 2020; Ahmed, 2019).

Strategic Planning—defined as the continuous process of monitoring internal and external environments to identify emerging opportunities and threats (Abu Jabara, 2020)—is another critical enabler of resilience in higher education. It enables institutions to anticipate change, adapt proactively, and design effective strategies (Al-Mamary et al., 2020; Jalod et al., 2022; Sony et al., 2023). This approach is particularly vital for maintaining competitiveness, as it facilitates early detection of trends that can influence entrepreneurial performance (Abusamra, 2023; Ouali & Ouali, 2024). In Gaza, strategic planning must extend beyond market analysis to address security risks and political instability, requiring mechanisms for rapid crisis response (Shumali et al., 2021). Evidence indicates that universities with established strategic frameworks are better equipped to navigate crises and maintain stable academic and administrative operations (Dewi & Ahamat, 2018; AMAN, 2023).

Entrepreneurial performance—reflecting an institution’s ability to achieve sustainable growth, foster innovation, and meet entrepreneurial objectives (Somnuk et al., 2023)—is measured through indicators such as financial growth, innovation output, stakeholder satisfaction, and adaptability (Subedi, 2021). In volatile environments like Gaza, entrepreneurial performance not only measures competitiveness but also serves as an indicator of institutional resilience. To enhance such performance, Palestinian universities are adopting innovative pedagogical approaches, expanding academic programs, forging international partnerships, and integrating modern technologies into education (Abu Zeyad & Az-Zain, 2021; Salem, 2020).

Extensive research links IT capabilities, strategic agility, and entrepreneurial performance across sectors. Studies highlight that IT adoption capability significantly strengthens entrepreneurial and technological orientations, improving institutional performance (Arif et al., 2022). Furthermore, strategic alignment and learning orientation have been identified as mediators between entrepreneurial orientation and innovation performance, particularly in sectors requiring high operational complexity (Ali et al.,

2022). The literature also underscores the role of strategic agility in driving innovation and organizational learning, which in turn enhances performance in small and medium-sized enterprises (SMEs) (Troise et al., 2023; Munawar et al., 2023). These findings collectively emphasize the need for universities in conflict-affected regions to prioritize IT development, strategic alignment, and organizational agility to secure long-term entrepreneurial success.

Higher education in Palestine encompasses a diverse network of institutions, including traditional universities, university colleges, community colleges, and Al-Quds Open University with its branches across the West Bank and Gaza Strip. According to the PCBS, (2024), there are 50 higher education institutions in total: 19 universities, 14 university colleges, and 17 community colleges. These institutions serve more than 225,000 students, of whom approximately 62% are women—a figure that reflects significant female participation in higher education despite persistent socio-economic challenges.

However, these positive enrollment figures contrast sharply with the realities of the Palestinian labor market. Unemployment among graduates aged 19–29 holding an associate diploma or higher stands at around 47%, with the rate reaching nearly 73% in the Gaza Strip compared to about 30% in the West Bank (PCBS, 2024). This situation often extends the waiting period for graduates to secure their first job, in some fields approaching a full year (PCBS, 2024). Although technical and vocational education offers more direct employment prospects, it continues to receive less attention than academic programs, limiting the education system's ability to respond promptly to market demands.

These challenges are further compounded by recurring political and economic crises, which reached their peak with the war that erupted in Gaza in 2023. Heavy bombardment destroyed or severely damaged numerous university buildings, halted the education of thousands of students, and claimed the lives of distinguished academics, leading to the suspension of ongoing research projects (OCHA, 2024; UNESCO, 2024; Al Jazeera, 2024). This reality compels Palestinian universities to rethink their strategies and adopt more adaptive approaches to ensure the continuity of education and to improve graduates' employment prospects despite an unstable operating environment.

Within this context, focusing exclusively on academic performance is no longer sufficient to capture universities' capacity to respond to crisis conditions. Entrepreneurial performance offers a broader and more dynamic lens that reflects universities' ability to innovate, mobilize resources, build partnerships, and sustain operations under severe disruption. In conflict-affected environments such as Gaza, universities increasingly function as resilience-oriented

institutions that must generate alternative resources, maintain stakeholder engagement, and support socio-economic recovery when conventional academic processes are interrupted (Coelho & da Silva, 2025; UNESCO, 2021). Accordingly, entrepreneurial performance is adopted in this study as a more appropriate outcome variable, as it captures Palestinian universities' adaptive capacity, strategic responsiveness, and innovation-driven contribution to society during periods of prolonged instability.

Problem statement

The study delves into the multifaceted challenges faced by Palestinian universities in Gaza, specifically focusing on the impact of financial constraints, disruptions in basic services, and unstable learning environments. These universities are situated in a region plagued by armed conflicts, which exacerbate the scarcity of essential resources and create a volatile setting for both educators and students (Coelho & da Silva, 2025; UNESCO, 2021).

Financial constraints severely limit the ability of these institutions to invest in necessary infrastructure, faculty development, and research initiatives (Abusamra, 2023; Abu Jarad & Naim, 2022). This lack of funding affects everything from the maintenance of existing facilities to the procurement of advanced technological tools required for modern education. Additionally, the intermittent availability of basic services such as electricity, water, and internet connectivity further hampers day-to-day operations, leading to frequent interruptions in the educational process (OCHA, 2024).

The unstable learning environment, characterized by the constant threat of violence and the psychological stress associated with living in a conflict zone, detrimentally affects the academic performance and mental well-being of students and staff (Coelho & da Silva, 2025). These disruptions not only impact the quality of education but also pose significant barriers to innovation and the pursuit of entrepreneurial activities, which are essential for economic and social development (Compagnucci & Spigarelli, 2020; Gür et al., et al., 2017).

The ongoing war in Gaza since October 2023 has had devastating consequences for the higher education sector, compounding pre-existing structural and resource challenges. Repeated airstrikes and shelling have destroyed or severely damaged university campuses, laboratories, libraries, and administrative facilities, rendering many academic buildings unusable (Al Jazeera, 2024; OCHA, 2024; UNESCO, 2024). Several institutions, such as the Islamic University of Gaza, have been partially or entirely shut down, with some facilities repurposed as shelters for displaced families (UNESCO, 2024) and the conflict has also resulted in the

loss of highly qualified faculty members, including professors in medicine, engineering, and the humanities, whose expertise cannot be easily replaced (Al Jazeera, 2024).

The disruption has been equally severe for students: tens of thousands have experienced prolonged suspension of classes, cancellation of exams, and the inability to participate in research or internship programs due to safety concerns and the destruction of essential infrastructure (Al Jazeera, 2024). Internet blackouts and power shortages have further hindered attempts to continue learning through online platforms, which had previously served as a lifeline during earlier crises (UNESCO, 2024; Al-Fraihat et al., 2020). Beyond the immediate academic setbacks, the war's impact threatens the long-term human capital development of Gaza, narrowing future opportunities for graduates and exacerbating already high unemployment rates (Palestinian Central Bureau of Statistics, 2024). This unprecedented destruction underscores the urgent need for adaptive strategies that safeguard educational continuity and preserve academic capacity under crisis conditions.

Given these formidable challenges, the study aims to explore how the strategic deployment of IT technical capabilities and Strategic Planning can serve as mitigating factors. By harnessing advanced information technology, universities can streamline administrative processes, facilitate remote learning, and improve resource management (Laudon & Laudon, 2022). For instance, robust IT systems can support online education platforms that ensure continuity of learning even during periods of physical disruption (Al-Fraihat et al., 2020). Additionally, Strategic Planning—defined as the ability to anticipate, recognize, and respond to emerging threats and opportunities—can enable universities to adapt more swiftly to changing circumstances (Sony et al., 2023; Jalod et al., 2022).

The research underscores the critical importance of innovation and adaptability in this context. By fostering a culture of innovation, universities can develop new pedagogical methods, diversify their funding sources, and engage in entrepreneurial ventures that generate additional revenue streams (Troise et al., 2023; Munawar et al., 2023). Adaptability, on the other hand, involves being responsive to immediate challenges and flexible in the implementation of educational programs (Ouali & Ouali, 2024).

Ultimately, this study aims to provide actionable insights into how Palestinian universities in Gaza can leverage IT capabilities and Strategic Planning to overcome their current obstacles. Achieving sustainable entrepreneurial performance will not only contribute to the resilience and growth of these institutions but also play a vital role in the broader socio-economic stability and development of the region (Somnuk et al., 2023; Subedi, 2021). The specific objectives of the study are as follows:

1. Analyze the relationship between IT technical capabilities and the entrepreneurial performance of Palestinian universities.
2. Explore the role of Strategic Planning as an intermediary variable in enhancing the relationship between IT technical capabilities and entrepreneurial performance.

By addressing these objectives, the study seeks to offer a comprehensive understanding of how advanced technological infrastructure and proactive strategic management can empower Palestinian universities to thrive despite their challenging circumstances.

Theoretical framework and underpinning theories

This study is anchored in a comprehensive theoretical framework that integrates the Resource-Based View (RBV), Dynamic Capabilities Theory, and Strategic Fit/Alignment Theory to explain how information technology (IT) capabilities contribute to entrepreneurial performance in higher education institutions, both directly and indirectly through strategic planning. The integration of these perspectives is particularly appropriate for studies employing structural equation modeling (SEM), as they collectively specify causal pathways linking organizational resources, strategic processes, and performance outcomes within complex and uncertain environments.

According to the Resource-Based View (RBV), organizational performance and competitive advantage are primarily determined by the possession and effective deployment of strategic resources that are valuable, rare, difficult to imitate, and non-substitutable. In the context of higher education institutions, IT capabilities—encompassing advanced information systems, digital infrastructure, and specialized technical human capital—constitute critical strategic resources that enhance operational efficiency, support innovation, and strengthen organizational decision-making processes. From an RBV perspective, universities that develop and leverage robust IT capabilities are better positioned to generate innovative educational services, improve stakeholder engagement, and support entrepreneurial initiatives such as knowledge commercialization, digital learning platforms, and collaborative partnerships. Accordingly, RBV provides a strong theoretical foundation for the direct relationship between IT capabilities and entrepreneurial performance, as superior technological resources enable universities to translate internal strengths into externally visible entrepreneurial outcomes (Sony et al., 2023; Danilo et al., 2023; Arif et al., 2022).

While RBV explains the strategic value of IT resources, it does not fully account for how these resources are continuously adapted and redeployed in highly volatile and uncertain environments. This limitation is addressed by Dynamic Capabilities Theory, which emphasizes organizations' abilities to sense environmental changes, seize emerging opportunities, and reconfigure resources in response to external shocks and internal challenges. In conflict-affected and resource-constrained settings such as Gaza, higher education institutions operate under persistent uncertainty, disrupted funding streams, and infrastructural instability. Under such conditions, the mere possession of IT resources is insufficient; universities must also possess the capability to dynamically adapt and reconfigure these resources to ensure continuity and innovation. IT capabilities enhance dynamic capabilities by enabling real-time information processing, environmental scanning, crisis monitoring, and data-informed decision-making. Within this framework, strategic planning represents a core dynamic capability, as it allows universities to systematically interpret IT-enabled information, anticipate threats and opportunities, and translate technological inputs into coordinated strategic responses that support resilience and entrepreneurial performance (Abu Zeyad & Az-Zain, 2021; Shumali et al., 2021; Troise et al., 2023).

Complementing RBV and Dynamic Capabilities Theory, Strategic Fit/Alignment Theory highlights the importance of aligning organizational resources with strategic objectives and managerial processes to achieve superior performance outcomes. This perspective argues that IT capabilities do not automatically yield performance benefits unless they are effectively aligned with institutional strategies, governance structures, and planning processes. In higher education institutions, strategic planning serves as the primary mechanism through which IT resources are integrated into broader organizational priorities, innovation agendas, and entrepreneurial orientations. By aligning technological capabilities with strategic goals, universities can ensure that IT investments support entrepreneurial initiatives such as digital transformation, partnership development, and resource diversification. Strategic Fit Theory therefore provides a clear theoretical justification for the mediating role of strategic planning in the relationship between IT capabilities and entrepreneurial performance, explaining how alignment transforms technological potential into realized entrepreneurial value (Arif et al., 2022; Ali et al., 2022; Jalod et al., 2022).

Taken together, these three theoretical perspectives form a coherent and mutually reinforcing framework for the proposed conceptual model. RBV explains which organizational resources matter (IT capabilities), Dynamic Capabilities Theory explains how these resources are mobilized,

adapted, and reconfigured under conditions of uncertainty (through strategic planning), and Strategic Fit/Alignment Theory explains why alignment between IT capabilities and strategic processes is essential for achieving entrepreneurial performance. This integrated theoretical framework not only strengthens the conceptual foundations of the study but also justifies the use of SEM to empirically examine both direct and mediated relationships among IT capabilities, strategic planning, and entrepreneurial performance in Palestinian universities operating under prolonged instability.

Hypotheses development

Building on the theoretical framework grounded in the Resource-Based View (RBV), Dynamic Capabilities Theory, and Strategic Fit/Alignment Theory, this section develops the study hypotheses by linking information technology (IT) capabilities, strategic planning, and entrepreneurial performance in higher education institutions. Each hypothesis is theoretically justified, supported by prior empirical evidence, and positioned to address an identified gap in the context of conflict-affected universities.

IT capabilities and entrepreneurial performance

From an RBV perspective, organizational performance is driven by the effective deployment of strategic resources that enable institutions to generate value and sustain competitive advantage. In higher education institutions, IT capabilities—such as robust digital infrastructure, advanced information systems, and skilled technical human resources—represent critical strategic assets that support innovation, operational efficiency, and external engagement. These capabilities enhance universities' ability to develop innovative educational services, strengthen partnerships with external stakeholders, and pursue entrepreneurial initiatives aligned with labor market and societal needs.

Empirical studies across different sectors consistently demonstrate that IT adoption and technological capability positively influence entrepreneurial orientation, innovation outcomes, and organizational performance (Arif et al., 2022; Troise et al., 2023). Within higher education, IT-enabled platforms facilitate digital learning, knowledge commercialization, and collaborative networks, all of which are core components of entrepreneurial performance. Although prior research has examined the role of IT capabilities in organizational performance broadly, limited attention has been given to their direct impact on entrepreneurial performance in higher education institutions, particularly in fragile and conflict-affected contexts. Addressing this gap, the present study posits that universities with stronger IT capabilities are better positioned to achieve higher levels of entrepreneurial performance.

H1 There is a positive relationship between information technology (IT) capabilities and the entrepreneurial performance of Palestinian universities.

IT capabilities and strategic planning

Dynamic Capabilities Theory emphasizes that organizational success in turbulent environments depends not only on possessing valuable resources, but also on the ability to sense environmental changes, seize emerging opportunities, and reconfigure resources accordingly. In this regard, IT capabilities play a central role in enhancing strategic planning processes by enabling real-time data collection, environmental scanning, and informed decision-making.

In higher education institutions operating under uncertainty—such as Palestinian universities in Gaza—strategic planning relies heavily on accurate information regarding external threats, resource availability, and institutional priorities. IT capabilities support these processes by facilitating access to timely information, integrating internal and external data sources, and improving coordination across organizational units. Prior studies indicate that IT capabilities significantly enhance strategic flexibility, strategic alignment, and planning effectiveness, particularly in environments characterized by rapid change and resource constraints (Sony et al., 2023; Abu Zeyad & Az-Zain, 2021; Shumali et al., 2021).

Despite this evidence, the relationship between IT capabilities and strategic planning remains underexplored in the context of higher education institutions facing prolonged crisis conditions. This study therefore advances the argument that IT capabilities constitute a foundational enabler of effective strategic planning in Palestinian universities.

H2 Information technology (IT) capabilities have a positive effect on strategic planning in Palestinian universities.

Strategic planning and entrepreneurial performance

Strategic Fit/Alignment Theory posits that organizational performance is maximized when strategic processes are effectively aligned with available resources and environmental conditions. Strategic planning serves as the primary mechanism through which universities translate resources and capabilities into coherent actions that support innovation, external engagement, and entrepreneurial initiatives.

In higher education institutions, strategic planning enables universities to align their academic offerings, technological investments, and partnership strategies with

emerging market demands and societal challenges. Empirical research suggests that institutions with well-developed strategic planning processes are more capable of fostering innovation, improving stakeholder satisfaction, and achieving entrepreneurial objectives (Dewi & Ahamat, 2018; Jalod et al., 2022; Ouali & Ouali, 2024). Strategic planning is particularly critical in crisis-affected environments, where universities must continuously adjust priorities, reallocate resources, and develop contingency strategies to sustain operations and performance.

While existing studies confirm the positive association between strategic planning and organizational performance, there remains a need to examine this relationship specifically in terms of entrepreneurial performance within higher education institutions, especially under conditions of political instability and resource scarcity. Accordingly, this study hypothesizes that effective strategic planning contributes directly to enhanced entrepreneurial performance in Palestinian universities.

H3 Strategic planning has a positive effect on the entrepreneurial performance of Palestinian universities.

The mediating role of strategic planning

Integrating RBV, Dynamic Capabilities Theory, and Strategic Fit/Alignment Theory, this study conceptualizes strategic planning as a critical mediating mechanism through which IT capabilities influence entrepreneurial performance. While IT capabilities provide the technological foundation for innovation and information processing, strategic planning determines how these capabilities are deployed, aligned, and transformed into entrepreneurial outcomes.

In conflict-affected contexts, the direct impact of IT capabilities on performance may be constrained by environmental volatility, funding instability, and infrastructural disruption. Strategic planning mitigates these constraints by enabling universities to prioritize initiatives, coordinate responses, and align IT investments with entrepreneurial objectives. Prior research supports the mediating role of strategic and organizational processes in translating technological resources into performance outcomes (Arif et al., 2022; Ali et al., 2022; Jalod et al., 2022). However, empirical evidence on this mediation mechanism remains limited within higher education institutions operating under extreme uncertainty.

By explicitly modeling strategic planning as a mediator, this study addresses this gap and provides a more nuanced understanding of how IT capabilities contribute to entrepreneurial performance in Palestinian universities.

H4 Strategic planning mediates the relationship between information technology (IT) capabilities and entrepreneurial performance in Palestinian universities.

Contextual constraints and entrepreneurial performance

Finally, it is important to acknowledge that the relationships proposed in this study unfold within a broader context of political instability, armed conflict, and resource scarcity. The ongoing war in Gaza has severely constrained universities' access to financial resources, technological infrastructure, and human capital (United Nations Office for the Coordination of Humanitarian Affairs, 2024; UNESCO, 2024; Coelho & da Silva, 2025). While this study does not directly model the impact of conflict as an independent variable, the hypotheses are developed with the recognition that contextual constraints may limit the magnitude of observed effects.

Accordingly, the proposed hypotheses should be interpreted within this challenging environment, where strategic planning and IT capabilities function as adaptive mechanisms that help mitigate—rather than eliminate—the adverse effects of external shocks on entrepreneurial performance.

Methodology

This section clarifies the methodology used in the study, including the research design, participants, data collection tools, and data analysis methods.

Research design

The study employs a descriptive and analytical quantitative research design to measure the relationship between the main variables: the technical capabilities of information technology (IT), Strategic Planning, and entrepreneurial performance in Palestinian universities under the current circumstances. This research design is appropriate for understanding the extent and nature of these relationships in a structured manner (Creswell, 2014).

The sample was drawn using a stratified random sampling technique to ensure representation across key strata, including academic discipline, functional role (faculty versus administrative staff), and type of institution (public, private, and open education). This approach allowed for capturing the diversity of perspectives within Palestinian universities, thereby enhancing the validity of the findings (Saunders et al., 2019). Data were collected between October 2023 and January 2024, during the height of the Gaza war, a period marked by severe disruptions to higher

education operations (United Nations Office for the Coordination of Humanitarian Affairs, 2024; UNESCO, 2024). Despite these challenges, a high response rate was achieved through a combination of on-site and online distribution methods, with contingency measures in place to address intermittent power and internet outages.

Data analysis was performed using IBM SPSS Amos (Analysis of Moment Structures), version 26, developed by IBM Corp. (2019). Amos v26 was selected for its robust capacity to conduct confirmatory factor analysis (CFA) and structural equation modeling (SEM) in social science research (Hair et al., 2019). While the software provided powerful modeling capabilities, its use under conflict conditions presented unique challenges, including interruptions to computational sessions due to power cuts and the need for repeated data verification to safeguard against corruption of output files.

The choice of covariance-based structural equation modeling (CB-SEM) using IBM SPSS Amos v26 was guided by both the theoretical orientation and empirical objectives of the study. CB-SEM is particularly appropriate when the primary aim is theory testing and model confirmation, rather than theory development or prediction (Hair et al., 2019). In this study, the proposed conceptual model was explicitly derived from well-established theoretical perspectives—namely the Resource-Based View (RBV), Dynamic Capabilities Theory, and Strategic Fit/Alignment Theory—which specify causal relationships among IT capabilities, strategic planning, and entrepreneurial performance. Accordingly, CB-SEM was selected as it enables rigorous assessment of the overall model fit and the theory-driven causal structure underlying the hypothesized relationships (Kline, 2016).

In addition, CB-SEM is suitable for studies employing latent constructs measured by multiple indicators and requiring simultaneous estimation of measurement and structural models (Hair et al., 2019). Given that the study seeks to examine both direct and indirect (mediated) effects within a theoretically grounded framework, CB-SEM provides a robust analytical approach that allows for explicit testing of mediation paths and evaluation of model adequacy using multiple goodness-of-fit indices (Kline, 2016).

Prior to conducting SEM analysis, key statistical assumptions associated with CB-SEM were carefully assessed. First, the sample size ($n=300$) exceeds commonly recommended thresholds for CB-SEM applications, ensuring adequate statistical power and model stability (Hair et al., 2019). Second, the assumption of multivariate normality was evaluated through inspection of skewness and kurtosis values, which fell within acceptable ranges for maximum likelihood estimation (Kline, 2016). Third, potential issues of multicollinearity were examined, and correlation coefficients among latent constructs were found to be below

critical levels, indicating that each construct captures a distinct theoretical dimension (Hair et al., 2019). Finally, the use of confirmatory factor analysis (CFA) prior to structural modeling ensured that all constructs demonstrated satisfactory levels of reliability, convergent validity, and measurement fit, thereby meeting the prerequisites for valid SEM estimation (Hair et al., 2019).

Taken together, these considerations confirm that the use of CB-SEM via IBM SPSS Amos v26 is both methodologically justified and theoretically aligned with the objectives of the study. This approach enables a rigorous examination of the hypothesized relationships and provides confidence that the reported structural paths reflect meaningful and theory-consistent associations among IT capabilities, strategic planning, and entrepreneurial performance in Palestinian universities.

Quantitative data were collected through structured questionnaires distributed to 300 participants working in Palestinian universities. The participants were selected to ensure a diverse and representative sample, including varying gender, age groups, educational levels, and professional experiences (Cresswell, 2014). The questionnaire was meticulously designed to capture detailed information on the participants' perceptions of IT capabilities, their Strategic Planning, and their views on entrepreneurial performance within their institutions.

The data collection process involved administering the questionnaires and ensuring a high response rate to achieve reliable and valid results (Saunders et al., 2019). Once collected, the data were subjected to rigorous statistical analysis. Descriptive statistics were used to summarize the demographic characteristics of the participants and provide an overview of the main variables. Confirmatory factor analysis (CFA) was employed to validate the measurement model and ensure that the constructs of IT capabilities, Strategic Planning, and entrepreneurial performance were accurately captured (Hair et al., 2019).

Participants

The study included a sample of faculty members and employees from various Palestinian universities. Participants were selected using a stratified random sampling technique to ensure balanced representation across key strata (Saunders et al., 2019):

1. Academic discipline (humanities and social sciences, natural sciences, engineering and technology, and health sciences);
2. Functional role (faculty members, administrative staff, and technical/IT personnel);

3. Type of institution (public universities, private universities, and open education institutions); and.
4. Geographical location (West Bank versus Gaza Strip).

This approach allowed the study to capture a wide range of perspectives, reflecting both disciplinary diversity and institutional variation. The final sample consisted of 300 individuals, distributed among several Palestinian universities. Demographic characteristics of the participants included gender, age, academic discipline, educational level, and professional experience (Table 1).

This table provides a detailed summary of the demographic characteristics of the participants. The study sample comprised 300 participants, with a higher representation of males (60%) compared to females (40%). The age distribution was fairly balanced, with the largest group being those aged 31–40 years (33.3%), followed by participants aged 41–50 years (30.0%), those aged 51 and above (20.0%), and the youngest group aged 20–30 years (16.7%). In terms of academic discipline, the largest group specialized in engineering and technology (30.0%), followed by humanities and social sciences (26.7%), natural sciences (23.3%), and health sciences (20.0%). The majority of participants held a master's degree (40.0%), while 33.3% had a bachelor's degree, and 26.7% held a PhD. Professional experience varied, with 33.3% having 5–10 years, 30.0% having 11–20 years, 20.0% less than 5 years, and 16.7% more than 20 years. This diverse and well-qualified sample provides valuable insights into the study's focus on IT capabilities, Strategic Planning, and entrepreneurial performance in Palestinian universities.

Table 1 Demographic characteristics of participants ($N=300$)

Variable	Category	<i>n</i>	%
Gender	Male	180	60.0
	Female	120	40.0
Age	20–30	50	16.7
	31–40	100	33.3
	41–50	90	30.0
	51 and above	60	20.0
Academic Discipline	Humanities & Social Sciences	80	26.7
	Natural Sciences	70	23.3
	Engineering & Technology	90	30.0
	Health Sciences	60	20.0
Educational Level	Bachelor's Degree	100	33.3
	Master's Degree	120	40.0
	PhD	80	26.7
Professional Experience	Less than 5 years	60	20.0
	5–10 years	100	33.3
	11–20 years	90	30.0
	More than 20 years	50	16.7

Data collection tools

Data for this study were gathered through a structured questionnaire specifically developed to address the research objectives. The instrument (See Appendix A) comprised a combination of closed-ended and open-ended items, organized into three main domains (Creswell, 2014):

- **IT Technical Capabilities:** Items addressing aspects such as the robustness of technical infrastructure, the efficiency of technical communication systems, and the qualifications and expertise of technical human resources.
- **Strategic Planning:** Items focusing on planning for marketing, environmental, technological, and competitive, capturing the institution's ability to anticipate and respond proactively to changes.
- **Entrepreneurial Performance:** Items reflecting strategic direction, resource orientation, management structure, rewards philosophy, and the cultivation of an entrepreneurial culture.

The questionnaire was adapted from validated instruments used in prior studies on IT capabilities, strategic planning, and organizational performance, with modifications to align with the Palestinian higher education context (Hair et al., 2019). This ensured strong content validity, as the items were grounded in well-established theoretical frameworks. A pilot test was conducted with 30 participants (excluded from the main sample) to assess clarity, relevance, and response consistency, leading to minor refinements in wording and structure (Saunders et al., 2019).

To further verify construct validity and reliability, a confirmatory factor analysis (CFA) was carried out using IBM SPSS Amos (Analysis of Moment Structures), version 26 (IBM Corp., 2019). All scales achieved Cronbach's α values exceeding 0.70, composite reliability (CR) above 0.70, and average variance extracted (AVE) at or above 0.50, indicating strong internal consistency and convergent validity (Hair et al., 2019).

Data analysis

The collected data were subjected to a series of statistical analyses designed to address the study's objectives and test its hypotheses. These analyses were conducted using IBM SPSS Amos (Analysis of Moment Structures), version 26

(IBM Corp., 2019), which offers advanced capabilities for structural equation modeling (SEM) and confirmatory factor analysis (CFA) (Hair et al., 2019).

The analysis followed three main steps:

1. **Descriptive Analysis** – Used to summarize the demographic characteristics of the participants and examine the distribution of responses across the study variables. This step provided a foundational understanding of the sample composition and variability.
2. **Confirmatory Factor Analysis (CFA)** – Conducted to assess the measurement model and verify that the observed items accurately represented their underlying latent constructs:
 - **IT Technical Capabilities** (technical infrastructure, technical communication, technical human resources).
 - **Strategic Planning** (marketing, environmental, technological, and competitive planning).
 - **Entrepreneurial Performance** (strategic direction, resource orientation, management structure, rewards philosophy, and entrepreneurial culture).
 - Model quality was evaluated using established fit indices, including the Goodness of Fit Index (GFI), Comparative Fit Index (CFI), Tucker–Lewis Index (TLI), Root Mean Square Residual (RMR), and Root Mean Square Error of Approximation (RMSEA).
3. **Structural Equation Modeling (SEM)** – Employed to test the hypothesized relationships between IT Technical Capabilities (independent variable), Strategic Planning (mediating variable), and Entrepreneurial Performance (dependent variable). SEM allowed for the simultaneous examination of direct and indirect effects within the proposed theoretical framework.

Confirmatory factor analysis of study instruments

To establish the **validity** and **reliability** of the study instruments, CFA results were examined for factor loadings, standardized regression weights (SRW), Cronbach's alpha, composite reliability (CR), and average variance extracted (AVE) as shown in Table 2.

The results indicate that all constructs achieved standardized factor loadings above 0.68 and were statistically significant at $p < 0.05$, demonstrating strong relationships

Table 2 Reliability coefficients

Construct	Estimate	<i>p</i>	SRW	Cronbach's α	CR	AVE
IT Technical Capabilities	0.70	<0.001	0.68	0.88	0.89	0.50
Strategic Planning	0.72	<0.01	0.70	0.85	0.87	0.52
Entrepreneurial Performance	0.75	<0.001	0.74	0.90	0.91	0.55

Note. SRW = standardized regression weight; CR = composite reliability; AVE = average variance extracted

between the observed items and their respective latent constructs. Cronbach's α values ranged from 0.85 to 0.90, exceeding the recommended threshold of 0.70, which confirms excellent internal consistency. Composite reliability (CR) values were all above 0.87, and AVE values ranged from 0.50 to 0.55, meeting the minimum criterion for convergent validity.

These results collectively confirm that the questionnaire was both psychometrically sound and theoretically robust, making it suitable for use in SEM to test the hypothesized model., were used to determine the adequacy of the models, as shown in Table 3 below.

The confirmatory factor analysis (CFA) results indicate that all three domains—IT Capabilities, Strategic Planning, and Entrepreneurial Performance—demonstrate acceptable to strong model fit indices.

- **IT Capabilities:** The CMIN/DF value of 2.010 is within the acceptable range (<3), indicating a reasonable fit between the model and the data. The GFI value of 0.946 suggests that 94.6% of the variance–covariance matrix is explained by the model. While the CFI (0.862) and TLI (0.793) are slightly below the ideal 0.90 threshold, they are still within the tolerable range for complex social science models. The RMSEA value of 0.071 indicates an acceptable level of approximation error.
- **Strategic Planning:** This domain shows the strongest fit among the three, with a CMIN/DF of 1.846, GFI of 0.928, and exceptionally high CFI (0.965) and TLI (0.954) values, well above the recommended 0.90 benchmark. The RMSEA value of 0.065 further supports an excellent fit, suggesting minimal model–data discrepancy.
- **Entrepreneurial Performance:** Although the CMIN/DF ratio (2.706) is slightly higher than in the other domains, it remains within the acceptable limit. The GFI (0.863) is moderate, while the CFI (0.901) and TLI (0.878) indicate a satisfactory fit. The RMSEA of 0.072

Table 3 Confirmatory factor analysis fit indices for study domains

Fit Index	IT Capabilities	Strategic Planning	Entrepreneurial Performance
CMIN	48.231	92.300	229.969
DF	24	50	85
CMIN/DF	2.010	1.846	2.706
GFI	0.946	0.928	0.863
CFI	0.862	0.965	0.901
TLI	0.793	0.954	0.878
RMR	0.066	0.030	0.052
RMSEA	0.071	0.065	0.072

Note. GFI=Goodness of Fit Index; CFI=Comparative Fit Index; TLI=Tucker–Lewis Index; RMR=Root Mean Square Residual; RMSEA=Root Mean Square Error of Approximation

is just within the acceptable threshold, reflecting a reasonable model approximation.

Overall, these results affirm that the measurement models for all three constructs are both statistically sound and theoretically consistent, providing a solid foundation for the subsequent Structural Equation Modeling (SEM) analysis.

Following the validation of the measurement models through CFA, Structural Equation Modeling (SEM) was applied using the maximum likelihood estimation method in IBM SPSS Amos v26 to test the hypothesized relationships among the study variables. The model specified IT Capabilities as the independent variable, Strategic Planning as the mediating variable, and Entrepreneurial Performance as the dependent variable.

- **IT Capabilities** were conceptualized through three latent dimensions: *IT human resources*, *IT infrastructure*, and *IT connectivity*.
- **Strategic Planning** comprised four latent dimensions: *marketing planning*, *environmental planning*, *technological planning*, and *competitive planning*.
- **Entrepreneurial Performance** was defined by five latent dimensions: *strategic orientation*, *resource orientation*, *management structure*, *rewards philosophy*, and *entrepreneurial culture*.

Each latent construct was measured through multiple observed variables (indicators), represented in the model as rectangles (e.g., *s1–s36*), while the latent constructs themselves were depicted as circles.

Path coefficients in the model indicate the strength and direction of the hypothesized relationships. The analysis revealed both direct effects (IT Capabilities \rightarrow Entrepreneurial Performance) and indirect effects (IT Capabilities \rightarrow Strategic Planning \rightarrow Entrepreneurial Performance), supporting the mediating role of Strategic Planning.

Model fit indices, including CFI, TLI, GFI, and RMSEA, confirmed that the structural model provided an adequate to strong fit to the observed data, aligning with recommended benchmarks for social science research.

Figure 1 visually presents the structural model, illustrating the interconnectedness between IT Capabilities, Strategic Planning, and Entrepreneurial Performance, and demonstrating the theoretical framework's empirical support in the context of Palestinian universities.

Result

The structural equation modeling (SEM) results, as illustrated in Fig. 1, provide empirical evidence to evaluate the four proposed hypotheses.

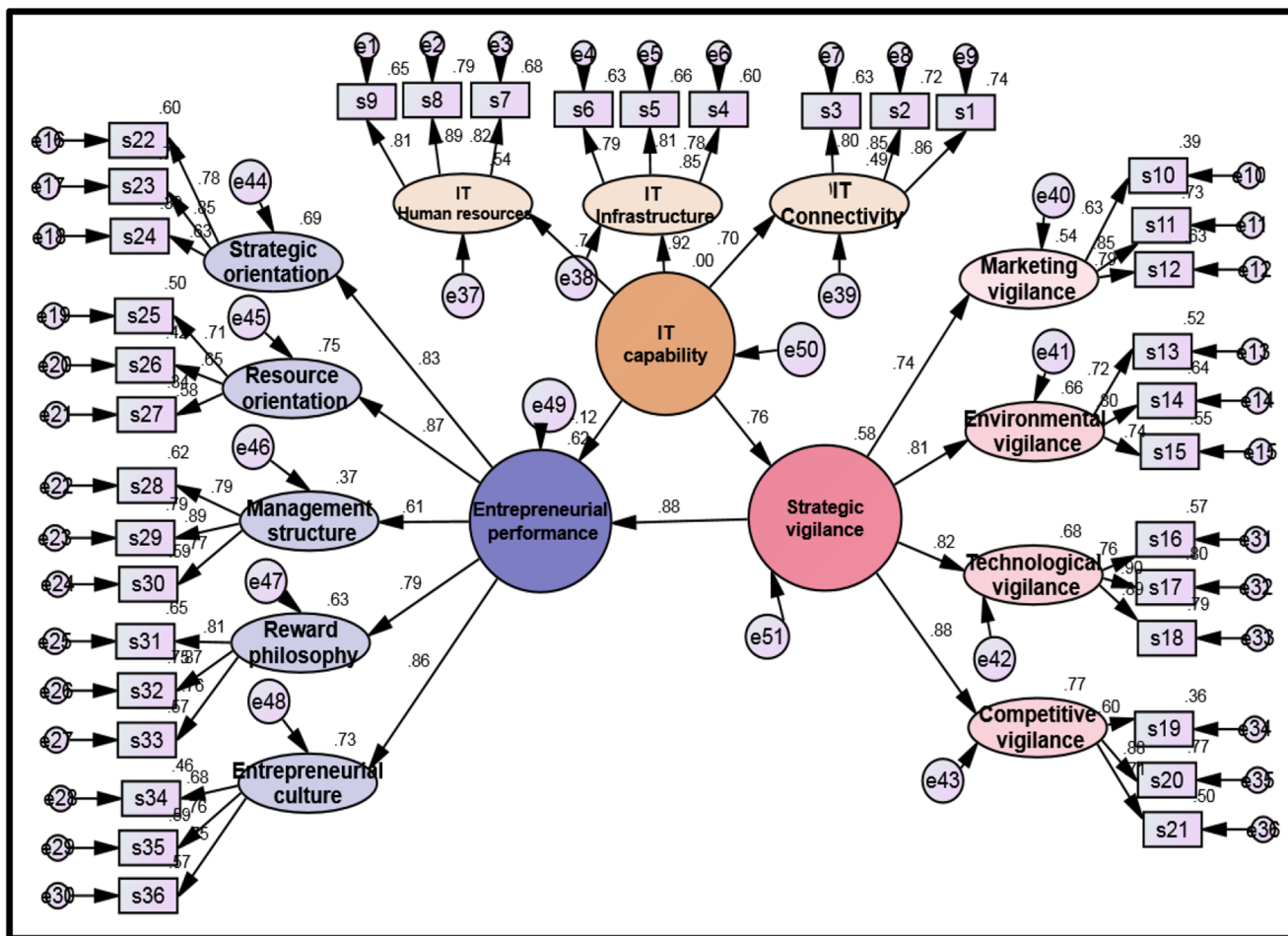


Fig. 1 Confirmatory factor analysis of the dimensions of the proposed structural model

Hypothesis 1 (H1): IT capabilities → entrepreneurial performance

Hypothesis 1 posited that there is a positive relationship between information technology (IT) capabilities and the entrepreneurial performance of Palestinian universities. The analysis revealed a direct positive path from IT capabilities to entrepreneurial performance, with a standardized regression weight of $\beta = 0.120, p = 0.043$. Although the effect size is modest, the relationship is statistically significant, indicating that stronger IT infrastructure, effective communication systems, and qualified technical human resources contribute meaningfully to enhancing entrepreneurial performance.

This finding is consistent with prior research emphasizing the role of IT capacity in improving organizational agility, innovation, and competitiveness in higher education (Al-Fraihat et al., 2020; Laudon & Laudon, 2022). Accordingly, H1 is supported.

Hypothesis 2 (H2): IT capabilities → strategic planning

Hypothesis 2 proposed that IT capabilities have a positive effect on strategic planning in Palestinian universities. The results indicate a strong and statistically significant relationship between IT capabilities and strategic planning ($\beta = 0.761, p < 0.001$). This suggests that universities with advanced technological infrastructure and capabilities are better equipped to engage in effective strategic planning processes, including environmental scanning, data-driven decision-making, and proactive response to institutional challenges.

This result aligns with existing literature highlighting the role of IT in enhancing strategic flexibility and planning effectiveness, particularly in dynamic and resource-constrained environments (Sony et al., 2023; Abu Zeyad & Az-Zain, 2021; Shumali et al., 2021). Therefore, H2 is strongly supported.

Hypothesis 3 (H3): Strategic planning → entrepreneurial performance

Hypothesis 3 examined whether strategic planning positively influences entrepreneurial performance. The findings reveal a substantial and statistically significant effect of strategic planning on entrepreneurial performance ($\beta=0.876$, $p<0.001$), indicating that institutions with well-developed planning processes are more capable of fostering innovation, aligning resources, and achieving entrepreneurial outcomes.

This finding is consistent with prior studies demonstrating that strategic planning enhances organizational performance by facilitating alignment between institutional goals, resource allocation, and innovation strategies (Dewi & Ahamat, 2018; Jalod et al., 2022; Ouali & Ouali, 2024). Thus, H3 is supported.

Hypothesis 4 (H4): Mediating role of strategic planning

Hypothesis 4 proposed that strategic planning mediates the relationship between IT capabilities and entrepreneurial performance. The mediation analysis indicates that strategic planning plays a partial mediating role in this relationship. While IT capabilities exert a statistically significant direct effect on entrepreneurial performance, the indirect effect through strategic planning is also significant.

This pattern suggests that IT capabilities influence entrepreneurial performance both directly and indirectly by enhancing strategic planning processes. These findings are consistent with prior research indicating that technological capabilities translate into performance outcomes through strategic and organizational mechanisms (Arif et al., 2022; Ali et al., 2022; Jalod et al., 2022).

The presence of partial mediation implies that strategic planning does not fully absorb the effect of IT capabilities but instead strengthens the alignment and utilization of these capabilities. This result supports the Resource-Based View, which posits that valuable resources such as IT capabilities can generate performance advantages independently while their impact is amplified when integrated into strategic processes (Sony et al., 2023; Danilo et al., 2023). It is also consistent with Dynamic Capabilities Theory, which emphasizes the role of strategic processes in adapting and reconfiguring resources under changing conditions (Abu Zeyad & Az-Zain, 2021; Troise et al., 2023).

From a strategic alignment perspective, the findings confirm that IT capabilities yield stronger performance outcomes when aligned with institutional strategies through formal planning processes (Arif et al., 2022; Jalod et al., 2022). Accordingly, H4 is supported, confirming the mediating role of strategic planning.

Discussion

In the Palestinian context, particularly in Gaza, universities face significant challenges in accessing and maintaining advanced IT infrastructure due to economic blockades and frequent disruptions caused by conflict. These circumstances create a landscape where obtaining the necessary technology and resources to build a strong IT framework is exceedingly difficult. For instance, the import restrictions and destruction of infrastructure due to ongoing conflict make it hard for these institutions to acquire and sustain essential IT equipment and resources (Laudon & Laudon, 2022).

Despite these formidable challenges, the results of the structural equation model (SEM) analysis indicate a positive relationship between IT capabilities and entrepreneurial performance. This underscores the critical role that robust IT infrastructure, effective IT communication, and skilled IT human resources play in fostering innovation and efficiency. The presence of a reliable IT infrastructure ensures that universities can support modern educational technologies and administrative processes, which are vital for innovation (Halpern et al., 2021; Abu Jabara, 2020). Effective IT communication channels enhance collaboration and knowledge sharing among faculty, staff, and students, thereby driving entrepreneurial activities (Sony et al., 2023; Strange & Zucchella, 2017). Skilled IT human resources are necessary to manage, maintain, and innovate within the IT infrastructure, ensuring its optimal use and continuous improvement (Danilo et al., 2023; Khaled, 2014; Laudon & Laudon, 2022).

Given the limited resources available in Gaza, Palestinian universities that manage to develop and maintain strong IT capabilities can gain a competitive edge. This competitive advantage allows these institutions to implement innovative solutions that not only improve their operational efficiency but also enhance their educational and research outputs. For example, universities with advanced IT capabilities can offer online courses and remote learning options, which are particularly important in areas with frequent disruptions (Abu Zeyad & Az-Zain, 2021). Additionally, they can leverage data analytics and other IT tools to streamline administrative processes, making them more efficient and effective (Abu Jabara, 2020; Ahmed, 2019).

This finding is particularly relevant as it highlights the necessity of prioritizing IT investments even in resource-constrained environments. Investing in IT infrastructure, communication, and human resources should be seen as a strategic priority for Palestinian universities (Khaled, 2014). Despite the high initial costs and ongoing maintenance challenges, such investments can yield substantial returns in terms of improved entrepreneurial performance (Arif et al.,

2022). By focusing on building robust IT capabilities, these universities can create an environment that supports innovation, enhances productivity, and ultimately contributes to the socio-economic development of the region (Khaled, 2014).

Strategic Planning is crucial in environments characterized by volatility and uncertainty, such as the Palestinian context. The significant mediating role of Strategic Planning, as demonstrated by the SEM results, underscores the importance of universities being adept at monitoring and responding to changes in both their external and internal environments. In such settings, Strategic Planning enables universities to harness their IT capabilities more effectively to enhance entrepreneurial performance (Shumali et al., 2021).

For Palestinian universities, Strategic Planning involves several key practices:

1. **Environmental Scanning:** This entails continuously monitoring the external environment to identify emerging trends, potential threats, and new opportunities. By staying informed about political developments, economic changes, social dynamics, and technological advancements, universities can anticipate and prepare for shifts that may impact their operations (Abusamra, 2023). For instance, being aware of potential disruptions due to conflict allows universities to develop contingency plans to maintain continuity in their educational and administrative functions (Koldas & Çıraklı, 2019).
2. **Competitive Analysis:** Understanding the competitive landscape is essential for Palestinian universities. This includes analyzing the strategies and performance of other educational institutions locally and globally. By benchmarking against peers and competitors, universities can identify best practices, innovate in their offerings, and improve their competitive positioning (Abusamra, 2023). This knowledge helps them to strategically allocate resources and make informed decisions to stay ahead in the education sector (Koldas & Çıraklı, 2019).
3. **Technological Forecasting:** Keeping abreast of technological advancements and trends is vital. Technological forecasting involves predicting future technological developments and assessing their potential impact on the university's operations and offerings (Al-Mamary et al., 2020). By proactively adopting new technologies, universities can enhance their IT infrastructure, improve teaching and research capabilities, and offer cutting-edge educational experiences (Ahmed, 2019). This foresight ensures that the IT resources are not only up-to-date but also aligned with future needs and opportunities (Abu Jabara, 2020).
4. **Internal Monitoring:** Strategic Planning also requires universities to monitor their internal processes and capabilities. This includes assessing the effectiveness of their IT infrastructure, the skills of their IT staff, and the efficiency of their operational processes. Regular internal audits and performance reviews help identify areas for improvement and ensure that resources are being utilized optimally to support entrepreneurial activities (Shumali et al., 2021).

The ability to anticipate and respond to threats and opportunities ensures that IT infrastructure and resources are utilized effectively to support entrepreneurial activities. This strategic approach is vital for universities operating under constant uncertainty and disruption (Shumali et al., 2021). For example, in the face of sudden conflicts or economic blockades, a university with strong Strategic Planning can quickly pivot to online learning platforms, secure alternative funding sources, or form strategic partnerships to mitigate the impact of such disruptions (Khaled, 2014; Laudon & Laudon, 2022).

Moreover, Strategic Planning facilitates agility and resilience. Universities that can swiftly adapt to changing conditions are better positioned to sustain their operations and continue delivering value to their stakeholders. This agility is particularly crucial in the Palestinian context, where unexpected challenges are frequent and can have severe implications for university performance (Dewi & Ahamat, 2018).

First, the study extends the Resource-Based View (RBV) by demonstrating that IT capabilities in higher education institutions generate entrepreneurial performance not only as valuable organizational resources, but also through their interaction with formal strategic processes under conditions of extreme uncertainty. This extends RBV applications beyond stable environments to conflict-affected higher education systems, a context that remains underexplored in prior research (Sony et al., 2023; Danilo et al., 2023).

Second, the identification of partial mediation provides nuanced theoretical insight into the IT–performance relationship. While Dynamic Capabilities Theory suggests that strategic processes are essential mechanisms for transforming resources into performance outcomes, the presence of a significant direct effect indicates that IT capabilities also retain an autonomous performance-enhancing role. This finding refines prior studies that implicitly assume full mediation and suggests that, in crisis contexts, technological capabilities may simultaneously function as operational enablers and strategic assets (Abu Zeyad & Az-Zain, 2021; Troise et al., 2023; Jalod et al., 2022).

Third, in comparison with studies conducted in stable or market-driven environments, which often emphasize

competitive advantage or efficiency gains, the present findings highlight resilience-oriented entrepreneurship as a distinct performance logic in conflict-affected higher education. In this sense, entrepreneurial performance in Palestinian universities reflects not only innovation and growth, but also institutional survival, adaptability, and socio-economic responsibility—thereby extending existing entrepreneurial university models to fragile and disrupted contexts (Compagnucci & Spigarelli, 2020; Coelho & da Silva, 2025; UNESCO, 2021).

The indirect support for Hypothesis 3, which posits that the war negatively impacts the availability of resources and technologies for Palestinian universities, thereby hindering their entrepreneurial performance, is evident from the broader context within which these universities operate. The ongoing conflict in Gaza has far-reaching implications for resource availability and technological access. Constant turmoil, economic blockades, and infrastructure damage create a hostile environment for educational institutions (Koldas & Çıraklı, 2019). These factors severely limit the ability of universities to procure and maintain essential resources, including advanced IT infrastructure, necessary for fostering entrepreneurial activities (Abu Jarad & Naim, 2022).

While the structural equation model (SEM) may not explicitly illustrate the impact of conflict, the significant relationships observed in the model can be inferred to support this hypothesis. For instance, the positive relationship between IT capabilities and entrepreneurial performance, and the mediating role of Strategic Planning, highlight how critical these factors are in the face of adversity (Arif et al., 2022; Troise et al., 2023). The significant paths in the model suggest that robust IT capabilities and Strategic Planning are essential for mitigating the adverse effects of war, even though the direct impact of conflict on resource scarcity is not depicted (Koldas & Çıraklı, 2019).

The findings underscore the critical need for robust IT capabilities and Strategic Planning to counteract the detrimental effects of war. In such a challenging environment, universities that can secure and optimize their IT resources, and strategically navigate the turbulent landscape, are more likely to sustain and enhance their performance (Shumali et al., 2021). This involves not only maintaining existing IT infrastructure but also continuously innovating and adapting to new technological solutions that can overcome the limitations imposed by conflict (Abu Jarad & Naim, 2022).

For example, Palestinian universities that have developed strong IT capabilities can leverage online platforms to ensure continuity in education despite physical disruptions. These institutions can employ cloud-based solutions to safeguard data and use virtual collaboration tools to maintain academic and administrative operations (Abu Jabara, 2020). Strategic Planning enables these universities to anticipate

potential threats, such as further escalation in conflict, and prepare accordingly by developing flexible and resilient IT strategies (Dewi & Ahamat, 2018).

Moreover, the resilience required of Palestinian universities to not only survive but also thrive amid conflict and resource scarcity is paramount. This resilience involves a proactive approach to resource management, continuous investment in IT capabilities, and a strategic focus on innovation (Shumali et al., 2021). Universities need to build partnerships with international organizations, seek alternative funding sources, and engage in collaborative research initiatives to bolster their resource base (Abusamra, 2023). By doing so, they can create a buffer against the uncertainties of their environment and ensure that entrepreneurial performance is not only maintained but also enhanced (Somnuk et al., 2023).

Implications for theory, practice, and policy

Implications for theory

This study offers several important theoretical contributions to the literature on information technology capabilities, strategic management, and entrepreneurial performance in higher education. First, it extends the Resource-Based View (RBV) by empirically demonstrating that IT capabilities function as strategic resources in higher education institutions operating under conditions of extreme uncertainty. Unlike most RBV-based studies conducted in stable or market-driven environments, this research shows that IT capabilities can generate entrepreneurial performance even in conflict-affected contexts, thereby broadening the boundary conditions of RBV.

Second, the findings refine Dynamic Capabilities Theory by providing empirical support for the role of Strategic Planning as a key dynamic capability that partially mediates the relationship between IT capabilities and entrepreneurial performance. The presence of partial rather than full mediation suggests that, in crisis environments, IT capabilities not only require strategic processes to be transformed into performance outcomes, but also retain a direct operational and resilience-enhancing role. This nuance contributes to ongoing theoretical debates regarding how resources and capabilities interact under environmental turbulence.

Third, the study contributes to Strategic Fit/Alignment Theory by empirically validating that alignment between IT capabilities and strategic planning processes enhances entrepreneurial performance in higher education institutions. The results highlight that technological assets alone are insufficient; rather, their value is maximized when coherently integrated into formal strategic frameworks. Collectively, these contributions provide a robust theoretical foundation for

modeling direct and mediated relationships using structural equation modeling (SEM) in higher education research.

Implications for practice

From a practical perspective, the findings underscore the critical importance of IT capabilities as enablers of entrepreneurial performance in Palestinian universities. University leaders and administrators should view investments in IT infrastructure, digital communication systems, and IT human capital not as optional enhancements, but as core strategic priorities—particularly in environments characterized by instability and resource scarcity.

The significant mediating role of Strategic Planning highlights the need for universities to move beyond ad hoc or reactive decision-making. Strategic Planning should be institutionalized as a continuous, adaptive process that integrates technological capabilities with entrepreneurial objectives, innovation agendas, and crisis-response mechanisms. Universities that systematically align their IT resources with strategic priorities are better positioned to sustain operations, foster innovation, and maintain stakeholder engagement during periods of disruption.

In addition, the results suggest that entrepreneurial performance in higher education should be interpreted broadly to include resilience, adaptability, and socio-economic contribution, rather than being limited to financial or commercial indicators. This perspective can guide university management in designing performance evaluation systems that better reflect the realities of operating in fragile and conflict-affected settings.

Implications for policy

At the policy level, the study provides evidence-based insights for higher education policymakers, governmental bodies, and international donors working in conflict-affected regions. The findings indicate that policies aimed at strengthening higher education resilience should prioritize digital transformation and strategic capacity-building alongside traditional academic support.

National higher education authorities are encouraged to develop policy frameworks that support long-term investment in IT infrastructure and strategic planning capabilities within universities, even during periods of political and economic instability. Such policies could include targeted funding for digital systems, incentives for strategic innovation, and capacity-building programs focused on strategic leadership and planning.

For international organizations and development partners, the results highlight the importance of supporting universities as key actors in socio-economic resilience and recovery. Investing in IT-enabled strategic capacity can

enhance universities' ability to sustain education, promote innovation, and contribute to broader development goals in conflict-affected societies.

Conclusion and recommendations

This study examined the relationships between information technology (IT) capabilities, Strategic Planning, and entrepreneurial performance in Palestinian universities operating under conditions of prolonged conflict and resource scarcity. The findings provide robust empirical evidence that IT capabilities—encompassing infrastructure, communication systems, and technical human resources—have a statistically significant positive effect on entrepreneurial performance, both directly and indirectly through Strategic Planning.

The results further confirm that Strategic Planning plays a partial mediating role in this relationship. This indicates that while IT capabilities independently enhance entrepreneurial performance, their impact is substantially strengthened when embedded within systematic strategic planning processes. In volatile and conflict-affected environments such as Gaza, this dual pathway highlights the importance of combining technological capacity with strategic foresight to sustain institutional performance.

Although the ongoing war and blockade were not explicitly modeled as latent variables, the broader contextual analysis provides indirect support for the negative impact of conflict on resource availability and technological access. These constraints underscore the critical importance of IT capabilities and Strategic Planning as resilience mechanisms that enable universities to maintain operations, support innovation, and fulfill their socio-economic role under extreme disruption.

Overall, the study demonstrates that entrepreneurial performance offers a more comprehensive and context-sensitive performance lens than academic performance alone, particularly in fragile higher education systems where universities must simultaneously ensure continuity, adaptability, and innovation.

Recommendations

Based on the study's objectives, methodology, and empirical findings, the following recommendations are proposed:

1. Strengthen IT Infrastructure and Capabilities.

Invest in upgrading IT infrastructure, including high-speed internet, cloud-based services, and cybersecurity systems, to enhance academic and administrative performance.

2. Institutionalize Strategic Planning.

Establish dedicated strategic planning units focusing on environmental, technological, competitive, and marketing scanning to anticipate and adapt to changes in the volatile Palestinian context.

3. Promote Capacity Building for Human Resources.

Implement continuous professional development programs for faculty and administrative staff in IT usage, data analytics, and online pedagogical methods to leverage IT capabilities effectively.

4. Develop Contingency and Crisis-Response Plans.

Adopt proactive measures such as shifting to online learning platforms during crises, creating redundant data storage systems, and developing remote administrative processes.

5. Foster Strategic Partnerships.

Collaborate with local and international academic institutions, NGOs, and the private sector to secure alternative funding sources, share technological resources, and create joint research opportunities.

6. Integrate Resilience into University Governance.

Embed resilience-building strategies into governance frameworks to ensure institutions can withstand economic blockades, resource scarcity, and conflict-related disruptions.

7. Leverage Data-Driven Decision Making.

Utilize advanced analytics tools to monitor performance indicators, student outcomes, and resource utilization, enabling evidence-based policy adjustments.

Limitations and future implications

It is important to note that this study did not investigate whether there are differences among participants based on their demographic characteristics, such as age, gender, or educational background. While demographic factors can influence perceptions and behaviors, they were not the primary focus of this research. Future studies could benefit from examining how

demographic variables might moderate or mediate the relationships between IT capabilities, Strategic Planning, and entrepreneurial performance. The focus on Palestinian universities provides valuable context-specific insights, but the findings may not be applicable to different geopolitical or economic settings. Additionally, the study broadly examines IT capabilities without distinguishing between different types of IT infrastructure or specific IT initiatives, and it does not systematically assess other external environmental factors such as economic fluctuations or political instability. Future research should address these limitations by employing more diverse samples and a broader scope of IT capabilities and environmental factors to enhance the robustness and generalizability of the findings. Policymakers and university administrators should focus on developing robust IT capabilities and strategic management practices to enhance entrepreneurial performance.

Appendix A. Survey questionnaire

Introduction

This questionnaire is designed for academic research purposes only and aims to examine the relationship between Information Technology (IT) Technical Capabilities, Strategic Planning, and Entrepreneurial Performance in Palestinian universities. All responses will be treated with strict confidentiality and will be used exclusively for scientific analysis.

Please read each statement carefully and indicate your response by selecting the option that best reflects your opinion.

Section A: Demographic information

Please tick (✓) one option only.

Table 4 Demographic information (Raw questionnaire)

Item	Question	Response Options
A1	Gender	<input type="checkbox"/> Male <input type="checkbox"/> Female
A2	Age	<input type="checkbox"/> 20–30 <input type="checkbox"/> 31–40 <input type="checkbox"/> 41–50 <input type="checkbox"/> 51 and above
A3	Academic Discipline	<input type="checkbox"/> Humanities & Social Sciences <input type="checkbox"/> Natural Sciences <input type="checkbox"/> Engineering & Technology <input type="checkbox"/> Health Sciences
A4	Educational Level	<input type="checkbox"/> Bachelor's <input type="checkbox"/> Master's <input type="checkbox"/> PhD
A5	Professional Experience	<input type="checkbox"/> Less than 5 years <input type="checkbox"/> 5–10 years <input type="checkbox"/> 11–20 years <input type="checkbox"/> More than 20 years

Section B: IT technical capabilities

Please indicate your level of agreement using the following scale: 1=Strongly Disagree | 2=Disagree | 3=Neutral | 4=Agree | 5=Strongly Agree

Table 5 IT technical capabilities items

Code	Item
IT1	The university has IT staff with sufficient technical expertise.
IT2	The university provides continuous IT-related training for employees.
IT3	IT personnel can efficiently solve technical problems.
IT4	The university has reliable and up-to-date IT infrastructure.
IT5	Information systems effectively support academic and administrative processes.
IT6	IT infrastructure enables effective internal communication.
IT7	Digital networks connect university departments efficiently.
IT8	Internet access sufficiently supports university activities.
IT9	Digital platforms facilitate collaboration among staff and faculty.

Sources: Danilo et al. (2023); Al-Mamary et al. (2020); Laudon and Laudon (2022); Salem (2020)

Section C: Strategic planning

Please indicate your level of agreement using the same scale (1–5).

Table 6 Strategic planning items

Code	Item
SP1	The university monitors changes in student and labor market needs.
SP2	Marketing strategies are regularly updated.
SP3	Political and economic risks are continuously monitored.
SP4	Environmental changes are incorporated into strategic decisions.
SP5	The university anticipates future technological developments.
SP6	New technologies are proactively integrated into strategic plans.
SP7	Competitors' strategies are regularly analyzed.
SP8	Competitive positioning is considered in strategic planning.

Sources: Shumali et al. (2021); Abu Zeyad and Az-Zain (2021); Wooden and Wooden (2023)

Section D: Entrepreneurial performance

Please indicate your level of agreement using the same scale (1–5).

Table 7 Entrepreneurial performance items

Code	Item
EP1	The university actively seeks innovative opportunities.
EP2	Long-term strategies emphasize innovation and growth.
EP3	Resources are flexibly allocated to support innovation.
EP4	The university seeks alternative funding sources.
EP5	Decision-making encourages initiative and experimentation.
EP6	Organizational structure supports innovation.
EP7	Innovative ideas are recognized and rewarded.
EP8	Employees are encouraged to take calculated risks.
EP9	Creativity and innovation are promoted institutionally.
EP10	Entrepreneurial thinking is encouraged among staff.

Sources: Subedi (2021); Dewi and Ahamat (2018)

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Author contribution YA: Data Collection, Data Analysis, Methodological Expertise and Results Interpretation. OJ: Background, Literature Review, Conceptual Clarity, Manuscript Drafting and Final Drafting and Approval. HS: Citation Management, Manuscript Review. FA: Theoretical Framework Development, Drafting. MS: Conceptualization, Design, and Final Drafting.

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Data availability The data that support the findings of this study are available from the corresponding author upon special request.

Code availability No custom code was used in this study.

Declarations

Ethics approval and consent to participate Not Applicable.

Competing interest None.

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