CHALLENGES FACING TECHNOPRENEURS: A COMPREHENSIVE LITERATURE REVIEW AND RESEARCH FRAMEWORK FOR SUSTAINABLE GROWTH

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Abstract

Technopreneurship, the convergence of technology and entrepreneurship, serves as a critical engine for innovation-driven economic growth. This study critically reviews secondary sources and literature to identify and categorize the core challenges faced by technopreneurs, integrating insights across diverse disciplines and geographic contexts. Internal challenges include financial constraints, human resource limitations, and pressures from rapidly evolving technologies. External challenges encompass market volatility, fierce competition, regulatory uncertainties, and socio-cultural barriers. The study also highlights gaps in existing research, notably concerning government support mechanisms, the role of social media, and cultural resistance. Employing theoretical perspectives such as the Technology-Entrepreneurship-Performance nexus, Innovation Diffusion Theory, Resource-Based View, and Institutional Theory, the study proposes a comprehensive framework to understand and address these challenges. The findings have practical implications for technopreneurs, educators, policymakers, and investors, emphasizing the need for integrated approaches involving capacity building, innovative funding, policy reform, and ecosystem development. This research contributes a foundational structure for future inquiry and strategic interventions to empower technopreneurship as a sustainable driver of global innovation and economic development.

Keywords: Technopreneurship, Innovation, Entrepreneurial Challenges, Technology Commercialization, Financial Constraints, Human Resource Management, Market Competition,

Regulatory Environment, Resource-Based View, Innovation Diffusion, Institutional Theory, Economic Development

Introduction

Technopreneurship is a rapidly evolving phenomenon at the intersection of technology and entrepreneurship, wherein innovative technological knowledge is harnessed to establish and scale new business ventures. It essentially represents the integration of digital innovations, technical expertise, and entrepreneurial vision to drive value creation, competitive advantage, and economic development. This concept goes beyond traditional entrepreneurship by focusing explicitly on technology-enabled opportunities and by leveraging advancements such as artificial intelligence, cloud computing, and biotech innovations. Thus, technopreneurship fosters not only business growth but also technological progress and societal transformation in various industrial and service sectors (CIIT, 2025).

The rising significance of technopreneurs in the modern global economy cannot be overstated. Particularly in knowledge-based and emerging economies, technopreneurs are pivotal agents catalyzing innovation, job creation, and sustainable development. Cities known as technology hubs—like Silicon Valley in the US and Bangalore in India—illustrate how technopreneurship can shape regional and national economic environments by nurturing creativity and disruptive solutions. These ventures often operate under conditions of high uncertainty and rapid change, making their growth patterns distinct from conventional businesses. They act as key drivers for national competitiveness in a digital and innovation-driven world economy (Widjajanti, 2025).

Despite the promising opportunities presented by technopreneurship, technopreneurs face a distinct set of challenges that could impede their sustainable business growth. These challenges include difficulties in sourcing adequate funding, navigating complex and shifting regulatory environments, attracting and retaining skilled human capital, and managing technological obsolescence in fast-paced markets. Further, competitive pressures from established industry players and start-ups alike demand continuous innovation and agility. These obstacles are compounded by social and organizational factors such as work-life balance pressures and leadership skill deficits, which can strain the resilience and capacity of technopreneurs to succeed (CIIT, 2025; Widjajanti, 2025).

Investigating these multifaceted challenges is of paramount importance to understand how technopreneurs can overcome barriers and thrive. Such research enables stakeholders—including

policymakers, investors, educators, and support organizations—to formulate actionable strategies and supportive frameworks. Addressing the challenges strategically ensures that technopreneurship contributes more effectively to technological diffusion, economic diversification, and employment generation, particularly in underdeveloped and emerging markets. A focused exploration into these obstacles also reveals knowledge gaps and areas requiring policy reforms or ecosystem development, essential for nurturing thriving technopreneurship ecosystems globally.

Within this context, this study aims to critically review secondary sources and literature addressing the key challenges faced by technopreneurs globally. It synthesizes insights across disciplines and geographies to map the prevailing hurdles and threat factors in technopreneurship ventures. The study integrates theoretical frameworks such as the resource-based view, innovation diffusion theory, and institutional perspectives to provide a holistic understanding of operating environments and internal capabilities affecting technopreneurial success.

This research proposes a comprehensive framework to guide future scholarly research and practical interventions targeted at empowering technopreneurs. The framework summarizes implications for business practices, policy formulation, educational curriculum design, and ecosystem development to foster sustainable and resilient technopreneurship. The ultimate goal is to contribute to a deeper, evidence-based understanding of how technopreneurship sustains itself as a vital driver of innovation-led growth in contemporary global economies.

Literature Review

Definitions and Scope of Technopreneurship

Technopreneurship is widely defined in the literature as the entrepreneurial pursuit involving the commercialization of technological innovations. It integrates technology development with entrepreneurial risk-taking to create new value propositions in dynamic market conditions (CIIT, 2025; Widjajanti, 2025). Scholars emphasize that technopreneurship extends beyond mere business startup activities by embedding continuous innovation as a core feature, which differentiates it from traditional entrepreneurship. This innovation-centric nature entails the identification, development, and application of emerging technologies to meet unmet needs or solve complex societal problems, often under conditions of uncertainty and rapid change (Rajender et al., 2025). The scope of technopreneurship covers diverse sectors such as information technology, biotech, fintech, and green technologies, highlighting its multi-disciplinary and cross-industry influence.

Furthermore, technopreneurship involves a high degree of risk tolerance as entrepreneurs navigate technological uncertainties, market adoption challenges, and resource constraints simultaneously. Successful technopreneurs are not only innovators but also strategic risk managers, aligning technological capabilities with market demands to secure competitive advantage (Widjajanti, 2025). Technology commercialization—the process of bringing innovations from concept to market—is central to technopreneurship, requiring complex coordination between research and development, marketing, and financial investment (Rajender et al., 2025). Thus, this integration of innovation, risk-taking, and commercialization lies at the heart of technopreneurship's definition and operational scope.

Challenges in Capital Acquisition and Financial Constraints

One of the most documented challenges faced by technopreneurs is securing adequate capital for both startup and operational phases. Financial constraints arise due to the high initial investment needed for technology development, patenting, and market entry, which often exceeds the capabilities of personal or informal funding sources (CIIT, 2025). The risk profile of tech startups further complicates access to traditional financing as banks and investors frequently perceive these ventures as high-risk with uncertain returns (Widjajanti, 2025). As a result, technopreneurs rely heavily on venture capital, angel investors, or government grants, which involve complex negotiation and often dilute ownership (Rajender et al., 2025). This financial challenge impacts not only growth paths but also innovation cycles, limiting the ability to scale or pivot.

Moreover, operational financial stress is exacerbated by cash flow management difficulties and long development-to-market timelines typical of tech ventures. Maintenance of cutting-edge technology infrastructure and recruitment of skilled personnel require sustainable funding mechanisms, which are hard to stabilize in early stages (CIIT, 2025). Secondary sources suggest that financial constraints are a critical bottleneck impacting technopreneurial success and longevity, emphasizing the need for innovative funding models like crowdfunding or strategic alliances (Widjajanti, 2025). Thus, capital acquisition remains a vital and persistent challenge requiring multifaceted support.

Fierce Competition from Established Firms and Emerging Startups

Technopreneurs operate in highly competitive environments where they face threats not only from established industry incumbents but also from a proliferation of emerging startups. Established firms often possess vast resources, brand recognition, and developed customer bases, creating significant entry barriers for technopreneurs seeking market share (Rajender et al., 2025). These incumbents also

accelerate innovation cycles and can replicate or acquire emerging technologies, intensifying competitive pressure. Simultaneously, the relatively low entry barriers in some tech sub-sectors lead to intense rivalry among new ventures themselves, heightening competition for limited customer attention and investment capital (CIIT, 2025).

This competitive environment demands constant innovation and strategic agility, as technopreneurs must differentiate their offerings to survive and thrive. Secondary literature highlights how this pressure influences resource allocation decisions, prioritizing rapid product iteration and customer engagement (Widjajanti, 2025). The challenge extends beyond product competition to ecosystem control, where partnerships, intellectual property rights, and network effects play critical roles. Competitiveness thus requires technopreneurs to balance innovation speed with strategic market positioning, all under significant resource constraints.

Rapidly Changing Technological Environment

The technological environment within which technopreneurs operate is characterized by rapid evolution and short product life cycles. Continuous advancements in fields such as artificial intelligence, blockchain, and biotechnology require entrepreneurs to stay ahead of trends and constantly update their offerings (Rajender et al., 2025). This relentless pace presents a dual challenge: to innovate continually while avoiding obsolescence of existing products and business models. Moreover, the complexity of new technologies necessitates ongoing learning and adaptability, which may strain limited human and financial resources (Widjajanti, 2025).

The dynamic nature of the technological environment also introduces uncertainties in investment decisions and market timing. Entrepreneurs face pressure to forecast technology adoption curves accurately and manage incremental versus radical innovation risks (CIIT, 2025). Secondary sources underscore the importance of innovation ecosystems, strategic collaborations, and agile development methodologies as critical enablers for coping with technological dynamism. Hence, managing constant change emerges as a core challenge, shaping technopreneurial success paths.

Market Volatility and Identifying Local/Domestic Markets

Market volatility is a significant challenge for technopreneurs, particularly in identifying suitable local or domestic market opportunities. Fluctuations in consumer preferences, economic conditions, and regulatory environments make market prediction difficult, especially for tech products that often

pioneer new categories (CIIT, 2025). While global market access promises scale, technopreneurs frequently struggle with localization issues such as cultural differences, purchasing power disparities, and infrastructural gaps, limiting commercial success in target geographies (Widjajanti, 2025).

Identifying viable domestic markets is also complicated by fragmented customer needs and immature tech adoption ecosystems in emerging economies. The literature suggests that technopreneurs must employ market research, pilot testing, and iterative feedback mechanisms to refine product-market fit (Rajender et al., 2025). Addressing this challenge is critical since market acceptance directly affects funding inflows and growth sustainability. Thus, systemic market volatility demands both strategic foresight and operational resilience from technopreneurs.

Human Resource Challenges: Talent Access and Entrepreneurial Stress

Access to skilled talent remains a formidable challenge for technopreneurs, as high-tech sectors require specialized knowledge and competencies that are often in short supply (Widjajanti, 2025). Recruitment and retention difficulties stem from competition with larger firms offering better compensation, as well as geographic constraints limiting pool availability (CIIT, 2025). Building creative and agile teams capable of rapid problem solving is essential but resource-intensive, affecting innovation capacity and operational effectiveness. Furthermore, technopreneurs often face leadership deficits due to limited managerial experience or entrepreneurial training, intensifying human resource constraints (Rajender et al., 2025).

Balancing the demanding workload of tech entrepreneurship with personal well-being presents an additional stressor. Literature describes heightened levels of entrepreneurial stress linked to uncertainty, long working hours, and the pressure of multi-role responsibilities (CIIT, 2025). This work-life imbalance can affect decision-making quality and mental health, potentially jeopardizing business continuity. Empirical studies point to the need for psychosocial support mechanisms and training programs to build resilience, emphasizing that managing human capital and stress is fundamental to technopreneurship sustainability.

Regulatory, Legal, and Policy Uncertainties

Technopreneurs frequently navigate complex regulatory, legal, and policy environments that influence operational feasibility and strategic planning. Rapidly evolving technologies often outpace existing regulations, creating an ambiguous legal framework fraught with compliance risks (Widjajanti, 2025).

Intellectual property protections, data privacy laws, and sector-specific regulations can vary widely across jurisdictions, complicating market entry strategies and increasing transaction costs (Rajender et al., 2025). Uncertain government policies regarding funding and support can also limit access to crucial resources that technopreneurs rely on for scaling innovations.

This regulatory uncertainty creates additional challenges for technopreneurs in sectors such as healthcare, fintech, and environmental technology where the stakes of compliance are particularly high (CIIT, 2025). Secondary literature stresses the importance of proactive policy engagement and advocacy by technopreneurs to shape enabling frameworks. It also underscores the role of government agencies in fostering clear, transparent, and technology-friendly policies to promote innovation ecosystems. Therefore, navigating regulatory and policy hurdles emerges as a strategic imperative for technopreneurial ventures.

Theoretical Framework

This study employs the Technology-Entrepreneurship-Performance (TEP) nexus as its foundational conceptual framework. The TEP nexus posits a dynamic relationship between technological innovation, entrepreneurial action, and performance outcomes. It recognizes that technology provides the enabling capabilities and resources, entrepreneurship drives opportunity recognition and exploitation, and performance reflects the economic and innovative success of ventures. This framework is particularly relevant for understanding technopreneurship, where success depends not only on access to technology but also on the entrepreneur's ability to deploy it effectively in volatile market conditions. By focusing on this tripartite nexus, the study aims to capture the interplay between internal capabilities and external factors shaping technopreneurial performance.

Incorporated within this framework is the Innovation Diffusion Theory, which explains how new technologies and innovations are adopted and spread within markets and societies. This theory highlights the challenges technopreneurs face in gaining acceptance for novel products or services, including barriers related to perceived complexity, compatibility with existing systems, trialability, and observability. Understanding innovation diffusion is critical for examining adoption hurdles faced by technopreneurs, especially in contexts where consumers or businesses exhibit resistance or slow uptake of technological innovations. Thus, the theory provides insights into market dynamics and socio-cultural factors that influence the success of technopreneurial ventures.

To deepen the analysis of resources crucial for technopreneurial success, the Resource-Based View (RBV) is utilized. RBV emphasizes the importance of both tangible and intangible assets—such as financial capital, technology infrastructure, human talent, intellectual property, and organizational knowledge—which enable technopreneurs to overcome operational and strategic constraints. According to RBV, sustainable competitive advantage arises from resources that are valuable, rare, inimitable, and non-substitutable (VRIN criteria). This perspective helps explain how internal competencies boost innovation capabilities, support risk management, and facilitate effective commercialization of technology-based products and services.

Finally, the study integrates Institutional Theory to explore the regulatory, legal, and policy environments affecting technopreneurship. Institutional theory posits that organizational behavior and strategies are heavily influenced by formal regulations, industry standards, cultural norms, and legitimacy pressures. For technopreneurs, navigating regulatory complexities and adapting to evolving policy frameworks can be significant challenges that impact venture survival and growth. This theory sheds light on the external institutional pressures that either enable or constrain technopreneurial activities, underlining the need for supportive governance structures and proactive engagement with policy stakeholders.

Together, these theoretical perspectives provide a comprehensive lens to understand the multifaceted nature of technopreneurship. They enable an integrated analysis of how technological, entrepreneurial, resource-based, and institutional factors collectively shape the challenges and performance of technopreneurs in global and local contexts.

Methodology

This study employs a systematic literature review (SLR) methodology to critically analyze secondary sources related to the challenges faced by technopreneurs worldwide. Relevant peer-reviewed articles, conference papers, and reports were sourced from scholarly databases such as Scopus, Web of Science, and Google Scholar, focusing on publications from the last decade to capture contemporary insights. Inclusion criteria emphasized works addressing technopreneurship challenges, innovation, finance, human resources, markets, and regulatory environments. Articles not directly related to these themes or outside the scope of internationally recognized journals were excluded. The search process initially identified over 500 articles, which were screened and narrowed down to approximately 80 high-quality sources for detailed review.

The review followed a rigorous selection process involving title and abstract screening, full-text evaluation, and thematic synthesis. Thematic analysis helped categorize challenges into internal factors—such as financial, human resource, and technological constraints—and external factors including market volatility, competition, and policy uncertainties. The study further identified research gaps regarding government support mechanisms, social media's role, and cultural barriers. The synthesis integrates relevant theoretical frameworks such as the Technology-Entrepreneurship-Performance nexus, Innovation Diffusion Theory, Resource-Based View, and Institutional Theory to provide a comprehensive understanding of the multifaceted challenges.

By utilizing secondary data and published literature, the study maintains objectivity and comprehensiveness while highlighting multidimensional issues affecting technopreneurship. Although limited by potential publication bias and language constraints, this approach offers a reliable foundation for building a research framework and informing future empirical investigations and policy development. Ethical standards of proper citation and transparency in source selection were strictly adhered to throughout the review process.

Discussion

Internal and External Challenges

Internal Challenges

Financial Constraints

Financial constraints consistently emerge as a primary internal challenge for technopreneurs. Literature highlights that technopreneurial ventures typically face substantial difficulties in securing adequate funding, both at the inception and operational stages, due to the high capital intensity of technology development and commercialization activities (CIIT, 2025; Widjajanti, 2025). Traditional financing mechanisms such as bank loans are often inaccessible because of perceived risks and uncertain returns. This financial bottleneck limits the ability to invest in research and development, recruit skilled personnel, and scale operations. Moreover, technopreneurs frequently face cash flow instability due to extended development-to-market timelines, compounding their financial vulnerabilities (Rajender et al., 2025). These findings accentuate the critical need for innovative financial instruments and targeted investor support specific to technological ventures.

Human Resource Limitations

Human resource challenges are equally significant, with the literature documenting substantial difficulties in acquiring and retaining talent with requisite technological and managerial skills. The

high demand for specialized expertise in emerging fields such as AI and biotechnology exacerbates competition for talent, making it difficult for technopreneurs, especially startups, to attract skilled professionals (Widjajanti, 2025). The scarcity of entrepreneurial leadership skills further compounds this issue, as many technopreneurs excel technically but lack experience in strategic business management and team leadership (Rajender et al., 2025). Additionally, stress and work-life balance concerns pose psychological risks that impact productivity and decision-making capacity within technopreneurial teams (CIIT, 2025). These challenges necessitate focused capacity-building efforts and leadership development programs.

Technical and Innovation Pressures

Technological challenges revolve around the need for continuous innovation in highly dynamic markets. Rapid technological changes require technopreneurs to frequently update products and processes, which imposes considerable pressure on research and operational capabilities (Rajender et al., 2025). The risk of technological obsolescence and the high costs associated with experimentation and prototyping are significant challenges. Moreover, the complexity of integrating new technologies into existing systems and ensuring compatibility with user needs further complicates innovation efforts (Widjajanti, 2025). This underscores the importance of building robust innovation management systems and fostering collaborative ecosystems that support iterative development.

External Challenges

Market Volatility and Competition

On the external front, market volatility poses a significant challenge, with technopreneurs needing to navigate unpredictable consumer demand patterns, economic fluctuations, and fragmented local markets (CIIT, 2025). The literature reveals difficulties in accurately assessing domestic market needs and adapting products to localized contexts, which affects commercial success. Compounding this, competition from both established firms and other startups is fierce, with incumbents often leveraging scale and brand recognition to maintain dominance (Rajender et al., 2025). Startups face pressure to differentiate through rapid innovation and customer engagement while managing resource limitations, which can be overwhelming in nascent or saturated markets (Widjajanti, 2025).

Regulatory and Policy Uncertainties

Regulatory, legal, and policy uncertainties add another layer of complexity, as technopreneurs encounter inconsistent or unclear frameworks for emerging technologies (Widjajanti, 2025).

Intellectual property rights, data privacy laws, and compliance requirements can vary widely by region, creating operational challenges and increased costs (Rajender et al., 2025). This environment often inhibits risk-taking and delays market entry. Furthermore, existing governmental policies and support measures sometimes fail to align with the specific needs of technopreneurs, limiting their ability to benefit from public incentives or participate in innovation ecosystems (CIIT, 2025). These regulatory barriers highlight the need for proactive policy engagement and tailored governance frameworks.

Gaps in Literature

Government Support

Despite recognition of these challenges, gaps persist in the literature regarding the role of government support in facilitating technopreneurship. While some studies emphasize broad policy imperatives, there is limited empirical evidence on effective mechanisms of government intervention, such as incubators, subsidies, or innovation clusters specifically tailored for technopreneurs (Rajender et al., 2025). There is also a lack of comparative analyses across countries to identify best practices for public-sector facilitation of technology entrepreneurship (Widjajanti, 2025). This gap underscores the necessity for targeted research on policy designs that foster vibrant technopreneurial ecosystems.

Role of Social Media

Another underexplored area is the impact of social media and digital networking on technopreneurial success. Literature primarily focuses on traditional marketing and network formation but seldom addresses how technopreneurs use online platforms for brand building, knowledge sharing, and investor relations (CIIT, 2025). Understanding the strategic utilization of social media could reveal new avenues for overcoming recognition barriers and reaching global markets efficiently. This presents opportunities for future research integrating digital communication theories with technopreneurship studies.

Cultural and Social Barriers

Cultural and social barriers remain insufficiently examined despite their profound influence on entrepreneurial behaviors. In many contexts, cultural norms related to risk aversion, hierarchical business structures, and gender roles restrict access to resources and networks necessary for technopreneurial ventures (Widjajanti, 2025). Existing studies often treat these as peripheral issues rather than core determinants of technopreneurship outcomes. Addressing such cultural constraints requires interdisciplinary approaches combining sociology, psychology, and innovation studies, an area ripe for deeper inquiry.

Implications

Implications for Technopreneurs

The synthesis of challenges suggests that technopreneurs must adopt multifaceted strategies that address both internal capabilities and external environmental factors. They need to balance innovation efforts with sound financial and human resource management to build resilient ventures. Technopreneurs should also actively engage with regulatory bodies and market networks to navigate institutional complexities effectively (CIIT, 2025). Strategic use of emerging digital tools, including social media, may help overcome recognition and market access challenges. These insights call for technopreneurs to develop not only technical competencies but also broader managerial and networking skills.

Implications for Educators

Educators have a critical role in preparing future technopreneurs by designing curricula that integrate technical training with business management, innovation strategy, and leadership development (Widjajanti, 2025). Entrepreneurial education should also incorporate experiential learning and mentorship programs that simulate real-world challenges. Given the identified human resource constraints, continuous learning modules addressing stress management and work-life balance are necessary to build sustainable entrepreneur capacity. This holistic educational approach enhances readiness to face multifarious technopreneurial challenges.

Implications for Policymakers

For policymakers, the findings underscore the need for clear, technology-friendly regulatory frameworks that reduce uncertainty and encourage investment in innovative ventures (Rajender et al., 2025). Policies must be designed with input from technopreneurs to ensure relevance and responsiveness. Additionally, governments should enhance targeted support mechanisms such as financial incentives, incubator programs, and ecosystem-building initiatives that address specific barriers faced by technopreneurs. Policymakers must also promote cultural change that valorizes innovation and risk-taking as key drivers of economic growth.

Implications for Investors

Investors play a pivotal role in providing the financial and advisory support critical for technopreneur success. The literature indicates that beyond capital infusion, investors should engage as strategic partners, offering market insight, networking access, and governance guidance (CIIT, 2025).

Understanding the unique risk profiles of technopreneurial ventures is essential for tailored investment decisions that balance innovation potential with financial sustainability. Investors are encouraged to collaborate with public bodies and educational institutions to strengthen the overall support ecosystem.

Strategies to Mitigate Challenges

Capacity Building

Mitigating the identified challenges requires comprehensive capacity building at multiple levels. Technopreneurs need access to continuous skill development programs that enhance technological proficiency, business acumen, and leadership capabilities (Widjajanti, 2025). Public-private partnerships can facilitate knowledge transfer and training platforms, particularly in underserved regions. Capacity building should also emphasize psychosocial support to manage entrepreneurial stress and promote resilience. These efforts contribute to a robust talent pool and organizational strength crucial for sustainable growth.

Innovative Funding Models

Innovative funding models represent a promising strategy to address persistent financial constraints. Crowdfunding, venture philanthropy, and hybrid financing arrangements can complement traditional sources, providing more flexible and inclusive access to capital (Rajender et al., 2025). Governments and financial institutions can incentivize such models through regulatory facilitation and risk-sharing mechanisms. Additionally, embedding financial literacy and investment readiness training within technopreneurial ecosystems can improve the efficacy of these alternatives, reducing funding gaps.

Policy Advocacy and Knowledge Networks

Proactive policy advocacy by technopreneurs and supporting organizations is essential for reforming regulatory and institutional barriers (CIIT, 2025). Collaborative platforms that bring together stakeholders from industry, government, and academia can amplify voices and align interests for regulatory modernization. Knowledge-sharing networks also foster peer learning, best practice dissemination, and collaborative innovation, strengthening venture ecosystems (Widjajanti, 2025). Establishing such ecosystems enhances sustainability and collective capacity to overcome volatile and complex environments.

Conclusion

Technopreneurship stands as a critical driver of innovation, economic growth, and technological advancement in contemporary global economies. This study has underscored how the integration of

technology and entrepreneurial action fuels transformative business models and competitive advantage. However, technopreneurs face a complex array of internal and external challenges that threaten their sustainability and growth prospects. Financial constraints, limited access to skilled human resources, and the relentless pressure of technological innovation represent significant internal hurdles. Externally, intensified market competition, volatile consumer demands, and regulatory uncertainties further complicate the entrepreneurial environment.

The literature review and discussion reveal that while technopreneurs are essential to knowledge-based and emerging economies, systemic barriers persist. These include capital acquisition difficulties, talent shortages, the need for continuous innovation cycles, and the challenges of navigating fragmented regulatory environments. Moreover, gaps in understanding remain regarding the roles of government support, social media strategies, and cultural contexts in fostering technopreneurial success. Addressing these gaps is vital to creating effective support mechanisms and inclusive ecosystems for technopreneurs.

The findings emphasize the necessity for multifaceted approaches involving technopreneurs, educators, policymakers, and investors. Capacity building in entrepreneurship skills, innovative and flexible funding models, responsive and clear regulatory frameworks, and fostered networks for knowledge and resource sharing emerge as key strategies for overcoming challenges. Policymakers must prioritize technology-friendly policies while educators focus on comprehensive, interdisciplinary training to prepare resilient technopreneurs. Investors are encouraged to provide not just financial capital but also strategic mentorship to guide sustainable growth.

Sustained success in technopreneurship requires an integrated approach that balances technological innovation with strong management capabilities and supportive institutional environments. This study's proposed research framework offers a foundational structure for future empirical investigations and practical interventions aimed at empowering technopreneurs worldwide. By addressing both internal resource constraints and external environmental factors, stakeholders can collectively enhance the capacity of technopreneurs to become catalysts for innovation-led economic development. Ultimately, fostering a robust and resilient technopreneurial ecosystem is crucial for sustaining technological progress and driving equitable growth in the rapidly evolving global economy.

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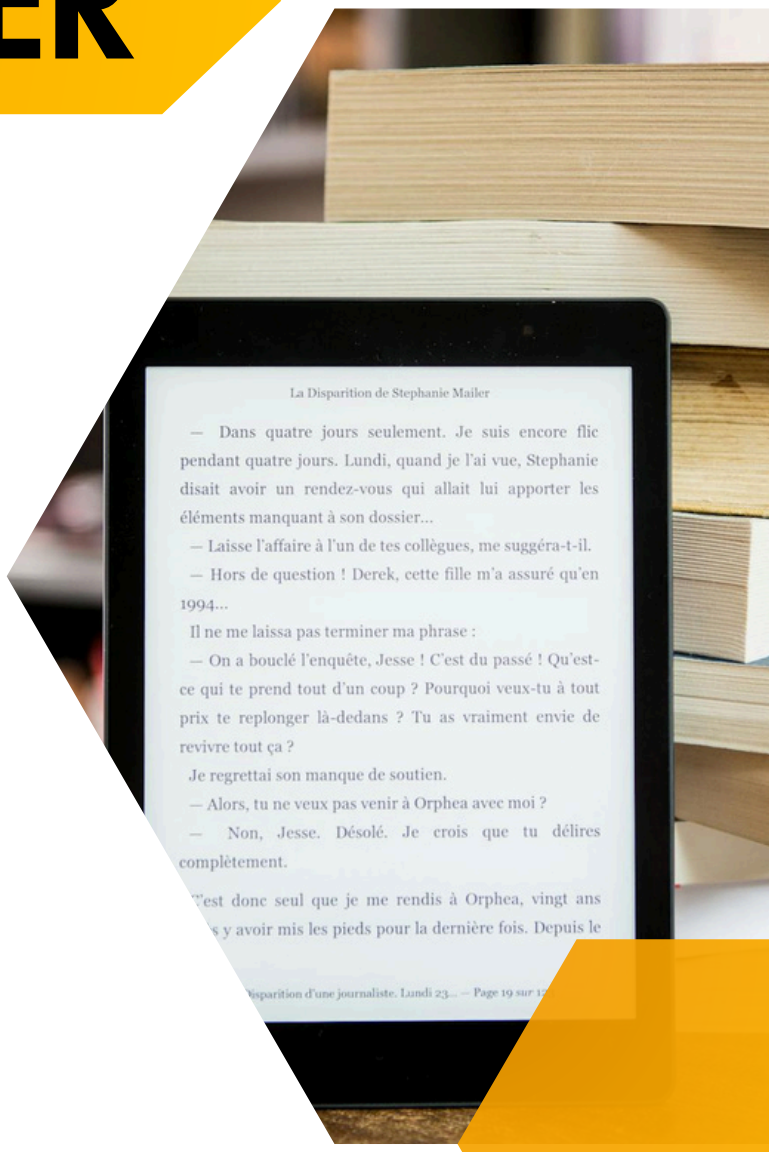

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