

Article

Exploring the Diffusion of Digital Technologies in Higher Education Entrepreneurship: The Impact of the Utilization of AI and TikTok on Student Entrepreneurial Knowledge, Experience, and Business Performance

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Abstract

This study investigates the impact of digital technology propagation, specifically artificial intelligence (AI) and the TikTok application, on enhancing student entrepreneurs' entrepreneurial knowledge, business experience, and the performance of their ventures. This research employs a mixed-methods design, combining qualitative and quantitative elements, with the quantitative aspect analyzed through Structural Equation Modeling–Partial Least Squares (SEM–PLS) and the qualitative aspect analyzed through in-depth interviews with student entrepreneurs. The survey included participation from 125 students, with three additional students serving as key informants. Research findings suggest that AI directly enhances entrepreneurial knowledge and business performance, whereas TikTok indirectly influences business success by affecting the acquisition of entrepreneurial learning. The utilization of AI has a substantial direct impact on entrepreneurial expertise and business performance. In contrast, the utilization of TikTok has a moderate influence on entrepreneurial knowledge, which in turn mediates its effect on entrepreneurial success. Offer practical implications for higher education institutions to integrate AI-driven analytics and social media marketing strategies into entrepreneurship curricula. Future research should investigate the regulatory framework, long-term implications, and the inclusion of other digital platforms to refine the digital transformation of entrepreneurship education further.

Keywords: artificial intelligence; TikTok; entrepreneurship education; digital marketing; business performance



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1. Introduction

In the current era of digital transformation, an increasing number of university students are venturing into entrepreneurship, leveraging emerging technologies to support and scale their business activities. However, there is a significant gap in empirical and theoretical understanding regarding how digital tools—particularly Artificial Intelligence (AI) and social media platforms like TikTok—contribute to students' entrepreneurial learning and the performance of their ventures. While these technologies are increasingly accessible,

their structured integration into higher education and entrepreneurship curricula remains limited and fragmented. The 2024 Global AI Student Survey by the Digital Education Council, which involved 3839 students across 16 countries, found that although 66% of students used AI tools like ChatGPT and over 69% used them for tasks such as information search or document summarization, 58% of students reported feeling inadequately skilled in AI usage, and 80% expressed dissatisfaction with how universities integrate AI into their education (Kelly, 2024). These findings highlight a significant gap between students' access to AI tools and their formal understanding of how to apply them effectively in professional or entrepreneurial contexts.

The integration of digital technology has enabled SMEs to enter new markets, improve operational efficiency, and drive the development of innovative products and services. Consequently, SMEs have emerged as pivotal contributors to economic growth and job creation in numerous countries (Harini et al., 2023). Additionally, in the contemporary era of digital transformation, technological advancements have led to substantial changes in various domains of life, including higher education (Feng & Chen, 2022; M. H. Huang & Rust, 2021; Rana et al., 2022; Saura et al., 2021). Digital innovations, such as AI and platforms like TikTok, are being integrated to enhance functionality and engagement, which has engendered novel opportunities in education and student entrepreneurship (Bokhari & Myeong, 2022; M. H. Huang & Rust, 2021; Uzir et al., 2023; Verma et al., 2021). These technologies offer innovation in the learning process and can be utilized as instruments to enhance students' business acumen and fortify their entrepreneurial experience. TikTok's user base has reached 1 billion worldwide, indicating a high level of popularity among younger demographics, including college students (Bhandari & Bimo, 2022; Cuesta-Valiño et al., 2022; Wahid et al., 2023). Beyond its role as a source of entertainment, the platform serves as a versatile tool for promoting businesses and facilitating digital learning. Its distinctive algorithm facilitates the rapid dissemination of content, a capability that university students can exploit to enhance the visibility of their products (Davenport et al., 2020; Rana et al., 2024; Suhartanto et al., 2022). Research has shown that marketing campaigns utilizing TikTok have a significant impact on brand awareness and consumer purchasing intentions.

Conversely, the utilization of artificial intelligence (AI) in higher education (HE) has undergone a substantial surge in the past five years (Crompton & Burke, 2023). The integration of AI in higher education (HE) has been marked by its growing application in automating tasks, providing comprehensive data analysis, and enhancing business decision-making processes. The incorporation of AI facilitates the acquisition of data-driven insights, aiding students in managing their business endeavors, encompassing market analysis and the optimization of marketing strategies (Dwivedi et al., 2021; Rana et al., 2024; Suhartanto et al., 2022; Tong et al., 2021).

Nonetheless, despite these advances, there are still limitations in research related to the integration of TikTok and AI in higher education curricula, which aim to improve students' entrepreneurial skills and business performance (Davenport et al., 2020; Mi Alnaser et al., 2023; Suhartanto et al., 2022). The incorporation of educational and AI-based technologies in teaching and learning presents its challenges, the main ones being curriculum development, infrastructure, and the lack of ethical considerations and technical knowledge among teachers (Arvin et al., 2023). A significant number of universities have yet to fully integrate these technologies into a structured learning process. Furthermore, there is a paucity of empirical studies that address the direct impact of using AI and TikTok on students' knowledge, experience, and business performance (Barta et al., 2023; Muhammad et al., 2024; Sharabati et al., 2022).

The diffusion of digital technology in higher education involves the adoption and integration of various digital tools to enhance learning effectiveness and student skill development. [Spann et al. \(2022\)](#) revealed that the term “diffusion of innovations” refers to the method by which new ideas or innovations are shared and spread across specific channels over time within a community or social group. In the context of higher education, technologies such as artificial intelligence (AI) and social media platforms like TikTok accelerate this diffusion process by offering novel methods for teaching, collaboration, and entrepreneurial skill development ([Barta et al., 2023](#); [Bhandari & Bimo, 2022](#); [Cuesta-Valiño et al., 2022](#); [Sharabati et al., 2022](#)).

The integration of Artificial Intelligence (AI) has become a pivotal element in contemporary higher education, particularly in enhancing students’ learning experiences and refining business decision-making processes. The potential of AI in analyzing market data, predicting trends, and optimizing marketing strategies is of paramount importance in the entrepreneurial landscape. The adoption of AI in higher education has undergone a substantial surge over the past five years, providing students with invaluable opportunities to develop analytical and strategic competencies ([George & Wooden, 2023](#)). Furthermore, AI facilitates the personalization of learning by ensuring that students receive materials tailored to their individual needs and learning styles.

TikTok, with over 1 billion active users, has evolved into a substantial platform that transcends the realms of mere entertainment, encompassing domains such as learning and business promotion ([Bhandari & Bimo, 2022](#); [Cuesta-Valiño et al., 2022](#); [Wahid et al., 2023](#); [Saragih et al., 2024](#)). The platform’s distinctive algorithm facilitates the rapid dissemination of content, a capability that university students can leverage to enhance the visibility of their work. Prior research has shown that marketing campaigns utilizing TikTok have a significant impact on brand awareness and consumer purchase intentions ([Wahyuni et al., 2024](#)). Furthermore, the platform’s accessibility facilitates the dissemination of knowledge, marketing methodologies, and entrepreneurial experiences, thereby helping students hone their business acumen.

Despite the considerable potential of artificial intelligence (AI) and the TikTok platform for enhancing education and entrepreneurship, the integration of these technologies into higher education curricula is encumbered by numerous challenges ([Barta et al., 2023](#); [Sharabati et al., 2022](#); [Wahid et al., 2023](#)). [Moore and Tillberg-Webb \(2023\)](#) stated that major obstacles to the adoption of these technologies include curriculum development, technological infrastructure, ethical considerations, and the technical knowledge of faculty members. Many higher education institutions have yet to fully integrate these technologies into a structured learning process, thereby limiting the potential for developing students’ entrepreneurial skills.

The extant research on the impact of artificial intelligence (AI) and the social media platform TikTok on students’ entrepreneurial knowledge and business performance is limited ([Bhandari & Bimo, 2022](#); [Cuesta-Valiño et al., 2022](#); [Davenport et al., 2020](#); [M. H. Huang & Rust, 2021](#)). However, preliminary studies suggest that the utilization of these technologies can enhance operational efficiency, broaden market reach, and fortify students’ marketing strategies. The optimization of AI in business data analysis and digital marketing strategies, particularly through TikTok, can potentially confer a competitive advantage for students engaged in entrepreneurial endeavors. These student entrepreneurs, who manage their ventures while pursuing higher education, are increasingly applying digital tools to evaluate and improve their actual business performance ([Barta et al., 2023](#); [Cuesta-Valiño et al., 2022](#); [Davenport et al., 2020](#); [M. H. Huang & Rust, 2021](#); [Wahid et al., 2023](#); [Setiawati et al., 2022](#)). Accordingly, in this study, the term ‘business performance’

refers explicitly to the measurable outcomes of student-led businesses, such as revenue growth, innovation, and market expansion.

The relationship between students' entrepreneurial knowledge, utilization of AI and TikTok, and resulting business performance is supported by several frameworks. First, in the context of this study, the Resource-Based View suggests that digital technologies, when uniquely and effectively applied by student entrepreneurs, can serve as strategic resources that offer a sustained competitive advantage, leading to superior business performance (Barney, 1991). AI-driven decision-making tools and social media platforms, such as TikTok, if leveraged appropriately, become intangible assets that enhance innovation and marketing capabilities. Finally, the Technology Acceptance Model provides insight into how perceived ease of use and usefulness influence students' willingness to adopt new technologies (Rana et al., 2024). As digital natives, student entrepreneurs tend to rapidly adopt AI and TikTok, integrating them into their business practices to improve outcomes. Together, these theories support the conceptual foundation of this study and justify the inclusion of student business performance as a dependent variable.

This study aims to address this knowledge gap by exploring the real impact of digital technology integration on the development of entrepreneurial skills and business performance of university students. Therefore, the objective of this study is to investigate how the adoption of digital technologies, specifically artificial intelligence and the TikTok application, can improve students' entrepreneurial knowledge, business experience, and business performance. The findings of this study are expected to provide novel insights for higher education institutions on integrating digital technology into a relevant curriculum that aligns with future industry requirements.

2. Literature Review and Hypothesis Development

2.1. Artificial Intelligence and Student Entrepreneurship

Artificial Intelligence (AI) has transformed numerous sectors, including education, marketing, and entrepreneurship. In the context of student entrepreneurship, AI is increasingly viewed not just as a support tool but as a strategic enabler. Students use AI tools such as ChatGPT, Grammarly, and Microsoft Copilot for a wide array of tasks—content creation, business planning, product naming, data analysis, and marketing automation (Dwivedi et al., 2021). These tools help reduce the time required for cognitive and operational processes, making entrepreneurial experimentation more accessible.

Rana et al. (2024) highlight that AI can significantly improve response accuracy, message personalization, and campaign performance in early-stage business development. AI platforms that automate customer interaction or generate business analytics data can support real-time decision-making in student-led ventures. Moreover, AI encourages confidence among novice entrepreneurs by offering low-risk simulations for business tasks, ranging from budgeting to email marketing.

Despite these benefits, recent findings from the Global AI Student Survey 2024 show a misalignment between access and literacy—58% of students admitted they lack the skills to use AI effectively for academic or professional purposes, and 80% believe universities have not adequately integrated AI tools into the curriculum. This gap makes the student entrepreneur group particularly important to study, as they represent both active technology adopters and self-directed learners. In this research, we investigate how the use of AI shapes students' entrepreneurial knowledge and influences business performance directly.

2.2. TikTok and Digital Marketing in Higher Education

TikTok is among the fastest-growing digital platforms and is increasingly used beyond entertainment. For student entrepreneurs, it has emerged as a valuable marketing

platform due to its algorithmic discoverability, ease of use, and built-in video editing tools (Wahid et al., 2023). Unlike traditional marketing tools that often require budgets or complex skills, TikTok offers students a space to practice marketing storytelling, receive feedback, and build organic audiences with minimal resources.

Islam et al. (2025) found that TikTok supports three levels of engagement for student entrepreneurs: (1) product showcasing through short-form videos, (2) interaction with customer communities via comments and duets, and (3) building personal branding. These forms of interaction foster experiential learning. Student entrepreneurs use TikTok to test promotional messages, experiment with aesthetics, and measure user responses. The visual and interactive nature of TikTok aligns with Gen Z's preferred communication style and provides a digital learning space where trial and error are encouraged.

In entrepreneurship education, however, TikTok is rarely formalized as a learning tool. Most university programs continue to prioritize traditional business plans and case studies, without incorporating social video platforms into the pedagogical process. This creates a gap between the tools students naturally use and the tools they are trained on. This study thus explores TikTok not just as a promotional outlet but as a learning and business-enabling platform that can influence entrepreneurial cognition and performance, albeit often indirectly.

2.3. Entrepreneurial Knowledge as a Mediator

Entrepreneurial knowledge encompasses both declarative (what) and procedural (how) knowledge related to recognizing opportunities, evaluating risks, launching ventures, and managing growth (Kolb et al., 2014). In the context of student entrepreneurship, this knowledge is rarely acquired solely through lectures; it is built through interactions with tools, communities, and feedback mechanisms. Entrepreneurial learning is experiential and depends heavily on real-world engagement, often in informal or digital settings.

The Experiential Learning Theory (Kolb et al., 2014) supports the idea that students develop entrepreneurial knowledge by cycling through concrete experience, reflective observation, abstract conceptualization, and active experimentation. As students use AI to simulate marketing copy or TikTok to test messaging, they engage in all four stages of this learning cycle. Each post, campaign, or prompt becomes a learning instance, enabling the student to reflect and iterate on entrepreneurial strategies. This contrasts with classical instruction that often focuses on static business concepts.

Research by Wahid et al. (2023) and McGrath and O'Toole (2016) emphasizes that students who engage with digital entrepreneurship tools tend to internalize business logic faster than those who only study it theoretically. Entrepreneurial knowledge is thus positioned in this study as a mediating variable—bridging digital tool usage (AI, TikTok) and business performance. We hypothesize that while AI may affect performance directly, TikTok's impact is more cognitive, operating through enhanced entrepreneurial understanding and strategy.

2.4. Effect of AI Utilization on Student Entrepreneurial Knowledge

Artificial Intelligence (AI) has emerged as a transformative tool in various domains, including entrepreneurship education. AI facilitates data-driven decision-making, enhances market analysis, and optimizes business operations, which significantly contributes to entrepreneurial knowledge acquisition (Dwivedi et al., 2021; Rana et al., 2024; Nurhayati et al., 2023). Through AI-driven analytics, students can gain insights into consumer behavior, competitive trends, and financial modeling, fostering a more strategic approach to entrepreneurship (Allil, 2024). Prior studies suggest that AI enhances cognitive

learning and practical business applications, thereby equipping students with essential entrepreneurial competencies (Saura et al., 2021).

The significant positive relationship between the utilization of AI and student entrepreneurial knowledge underscores the transformative potential of intelligent systems in entrepreneurial learning (Mi Alnaser et al., 2023; Rana et al., 2024). AI tools such as predictive analytics, automated market trend analysis, and personalized recommendation engines enable students to simulate real-world business scenarios and derive critical insights (Davenport et al., 2020; Feng & Chen, 2022; M. H. Huang & Rust, 2021). For instance, applications like ChatGPT and Canva AI assist in generating product descriptions, analyzing market sentiments, and designing promotional materials, all of which cultivate a deeper understanding of consumer behavior and branding. This aligns with the Technology Acceptance Model (TAM), wherein the perceived usefulness of AI contributes to its adoption in educational entrepreneurship (Bokhari & Myeong, 2022; Saura et al., 2021; Suhartanto et al., 2022; Tong et al., 2021).

Furthermore, the Diffusion of Innovations (DOI) theory explains how AI, as an innovation, spreads through student populations based on perceived advantage and compatibility with learning needs (Kwangsawad & Jattamart, 2022; Shaikh & Amin, 2025). Interviews with student entrepreneurs revealed that the use of AI in daily business activities significantly increased their confidence in managing digital ventures, especially when facing unpredictable consumer demands. However, knowledge acquisition through AI is not automatic. It necessitates a deliberate cognitive engagement with AI-generated outputs. Students reported that while AI could offer guidance on content creation, strategic thinking remained indispensable for creating compelling content. This highlights the dual role of AI: as an accelerator of data-driven insight and as a pedagogical tool that demands critical thinking (Bokhari & Myeong, 2022; Herrmann, 2023; M. H. Huang & Rust, 2021; Mi Alnaser et al., 2023; Verma et al., 2021).

In addition, AI contributes to the personalization of entrepreneurial education. Adaptive learning systems adjust content delivery based on individual proficiency levels, enabling students to master complex business concepts at their own pace (M. H. Huang & Rust, 2021; Mi Alnaser et al., 2023; Rana et al., 2022). This has been particularly beneficial for students with minimal prior exposure to entrepreneurship. The ability of AI to detect learning gaps and offer targeted modules fosters an inclusive educational environment. Moreover, AI-supported simulations and gamified learning experiences make entrepreneurship education more engaging, bridging the gap between theoretical knowledge and its practical application (Dwivedi et al., 2021; Kurniawan et al., 2024).

However, the challenge is that not all students have the digital literacy needed to utilize AI tools effectively. There is also a learning curve associated with interpreting AI analytics, especially among budding entrepreneurs (Allen, 2020; Neumeyer et al., 2020). The cost of premium AI features presents an additional barrier. Despite these limitations, the empirical data from this study, complemented by qualitative interviews, confirm that AI significantly enhances students' entrepreneurial knowledge and skills. As such, higher education institutions are encouraged to integrate AI literacy as a core component of entrepreneurship curricula, equipping students with not only the tools but also the mindset necessary for digital-age entrepreneurship (Butcher et al., 2024; Mahmud et al., 2022; Rana et al., 2022; Verma et al., 2021). Based on this, the following hypothesis is proposed:

H1. *The utilization of AI positively affects student entrepreneurial knowledge.*

2.5. Effect of TikTok Utilization on Student Entrepreneurial Knowledge

Social media platforms, particularly TikTok, have gained prominence as practical tools for digital marketing and business education. TikTok provides an interactive and dynamic environment where students can learn digital branding, content creation, and consumer engagement strategies (Bhandari & Bimo, 2022; Cuesta-Valiño et al., 2022; Nusraningrum & Endri, 2024). Research indicates that exposure to entrepreneurial content on TikTok enhances students' understanding of market dynamics and promotional tactics, thereby enriching their entrepreneurial knowledge (Wahid et al., 2023). Additionally, TikTok's algorithm enables the delivery of personalized content, which can facilitate targeted learning experiences (Davenport et al., 2020).

TikTok's unique content dissemination model and algorithmic personalization have redefined how entrepreneurial knowledge is absorbed by students (Bhandari & Bimo, 2022; Cuesta-Valiño et al., 2022; Sharabati et al., 2022). This study confirms that TikTok significantly contributes to the development of students' entrepreneurial acumen by providing exposure to diverse business models, marketing techniques, and consumer interaction strategies. Unlike traditional classrooms, TikTok offers real-time, peer-generated content that often includes tutorials, behind-the-scenes operations, and success stories that resonate with the experiences of student entrepreneurs (Muhammad et al., 2024; Sharabati et al., 2022; Wahid et al., 2023).

From a social learning perspective, TikTok supports observational learning where students emulate behaviors modeled by successful creators and entrepreneurs. For instance, students can learn how to create persuasive sales pitches, utilize trending sounds to enhance visibility, and interpret audience analytics to refine their content strategies. The interactive nature of TikTok allows immediate feedback in the form of likes, comments, and shares, creating a feedback loop that fosters iterative learning. The platform thus becomes a micro-learning environment where knowledge is not just consumed but also produced and validated socially (Barta et al., 2023; Cuesta-Valiño et al., 2022; Sharabati et al., 2022).

Qualitative interviews further revealed that students perceive TikTok as a more relatable and less intimidating learning platform compared to academic textbooks or lectures. The visual and narrative appeal of TikTok videos lowers the barrier to entry into entrepreneurial discourse, especially for students with limited business backgrounds. As one interviewee noted, the "TikTok algorithm teaches you what you need to learn by observing what you watch and engage with." This highlights the platform's ability to deliver contextually relevant knowledge tailored to user preferences (Siles et al., 2024; Barta et al., 2023; Klug et al., 2021; Sharabati et al., 2022).

However, this mode of knowledge acquisition requires discernment. The abundance of content on TikTok includes misinformation or oversimplified advice (Kirkpatrick & Lawrie, 2024; Bhandari & Bimo, 2022; Cuesta-Valiño et al., 2022; Wahid et al., 2023). Students must develop digital literacy skills to critically evaluate the credibility and applicability of what they consume. Furthermore, there is a need to balance entertainment with educational value to ensure that students are not merely mimicking trends but internalizing the principles behind effective marketing and brand communication (Yang et al., 2017; Barta et al., 2023; Muhammad et al., 2024; Sharabati et al., 2022). Despite these caveats, the data confirm that TikTok significantly enhances student entrepreneurial knowledge, provided that its use is guided by strategic intent and critical engagement. Therefore, the study posits the following hypothesis:

H2. *The utilization of TikTok positively affects student entrepreneurial knowledge.*

2.6. Effect of Student Entrepreneurial Knowledge on Student Business Performance

Entrepreneurial knowledge plays a crucial role in shaping business performance, particularly among student entrepreneurs. Knowledge of business operations, financial management, and marketing strategies enables students to make informed decisions, thereby enhancing their business success (Barta et al., 2023). Studies have shown that entrepreneurial education has a positive influence on business sustainability, innovation, and revenue growth (Muhammad et al., 2024). Furthermore, students equipped with strong entrepreneurial knowledge demonstrate better adaptability to market changes and improved problem-solving abilities (Verma et al., 2021).

The third hypothesis of this study finds robust support in the data, affirming that entrepreneurial knowledge is a key determinant of business performance among student entrepreneurs. Knowledge in areas such as financial literacy, strategic planning, customer segmentation, and risk management equips students with the tools necessary to navigate the volatile landscape of startup ventures (Arsawan et al., 2022; Reuben et al., 2021; Yoopetch et al., 2021). Unlike ad-hoc business operations based on intuition or imitation, knowledge-based decision-making promotes sustainability, scalability, and resilience (Yoopetch et al., 2021; Trakadas et al., 2020).

The quantitative findings revealed that entrepreneurial knowledge accounts for a substantial proportion of the variance in business performance. Students with high levels of knowledge reported higher revenue growth, customer retention, and product innovation (Tønnessen et al., 2021; Zhu & Deng, 2020). Qualitative evidence supports the finding that students emphasize the role of skills learned in budgeting, pricing strategies, and digital marketing. The knowledge gained from both AI tools and TikTok content was often converted into actionable strategies that improved business outcomes (Abi-Rafeh et al., 2024; Islam et al., 2025).

Entrepreneurial knowledge also cultivates adaptability. In a rapidly changing digital economy, students equipped with solid knowledge bases are more capable of adjusting their business models, pivoting products, or responding to market feedback. This dynamic responsiveness is a hallmark of successful entrepreneurs and is especially crucial in the early stages of business development. Moreover, students with a deeper understanding demonstrated a higher propensity for long-term planning, such as reinvesting profits or scaling operations through e-commerce platforms (Okolie, 2025; Arsawan et al., 2022; Saura et al., 2021; Yoopetch et al., 2021).

Nevertheless, the impact of entrepreneurial knowledge is moderated by students' ability to apply what they learn in authentic contexts. Some students reported difficulty in translating theoretical concepts into practice, indicating a need for more experiential learning opportunities within entrepreneurship education (Zhao et al., 2022; Tønnessen et al., 2021; S. N. Huang & Yang, 2022). This finding suggests that while knowledge is a necessary precondition for business performance, it must be coupled with practical application and mentorship to yield optimal results. Hence, universities must enhance curriculum design to include hands-on projects, business incubators, and peer collaborations. Given this, the following hypothesis is formulated:

H3. *Student entrepreneurial knowledge positively affects student business performance.*

2.7. Indirect Effect of AI Utilization on Student Business Performance, Mediated by Student Entrepreneurial Knowledge

While AI directly contributes to entrepreneurial knowledge, its impact on business performance may also be mediated through the acquisition of knowledge. AI-powered tools assist students in refining their business strategies, enhancing efficiency, and automating

decision-making processes (M. H. Huang & Rust, 2021). However, the effectiveness of AI in improving business performance largely depends on students' ability to interpret and apply insights generated by AI (Mi Alnaser et al., 2023).

The mediation analysis in this study reveals a nuanced dynamic: entrepreneurial knowledge does not significantly mediate the effect of AI on business performance. This finding suggests that the use of AI by students often leads to direct improvements in business operations, bypassing the traditional learning curve associated with knowledge acquisition. AI's automation and predictive capabilities allow even less-experienced students to optimize pricing, inventory, and marketing strategies with minimal theoretical background (Deliu & Olariu, 2024; De Bruyn et al., 2020).

One interpretation is that AI acts as a knowledge surrogate, offering prescriptive solutions that students can implement without fully understanding the underlying principles (Strohmann et al., 2023; Davenport et al., 2020; Feng & Chen, 2022). For example, an AI tool that suggests the best time to post content or the most effective keywords for SEO provides immediate performance benefits, even if students lack in-depth marketing expertise. This positions AI as a form of "scaffolding" that compensates for gaps in entrepreneurial knowledge.

However, while this direct effect is advantageous in the short term, it raises concerns about the depth and sustainability of entrepreneurial competence. Students who rely heavily on AI without building foundational knowledge may struggle when confronted with novel challenges or when the AI tools become unavailable (Bulathwela et al., 2024; Bokhari & Myeong, 2022; M. H. Huang & Rust, 2021; Saura et al., 2021; Tong et al., 2021). Therefore, while AI enhances efficiency and operational effectiveness, it should be complemented by reflective learning practices that reinforce conceptual understanding and deepen understanding.

Furthermore, the finding prompts a reevaluation of AI's role in pedagogy. Rather than treating AI as an external tool, educators might integrate AI into instructional design to simultaneously develop student competence and performance. For instance, using AI analytics dashboards in coursework can help students interpret data trends, generate business reports, and defend their strategies in simulations (Bokhari & Myeong, 2022; Herrmann, 2023; Suhartanto et al., 2022; Uzir et al., 2023). By doing so, AI becomes not just a means to an end, but a catalyst for deeper learning. As knowledge acts as an intermediary that translates AI-generated data into actionable business strategies, the study proposes the following hypothesis:

H4. *Student entrepreneurial knowledge mediates the relationship between AI utilization and student business performance.*

2.8. Indirect Effect of TikTok Utilization on Student Business Performance, Mediated by Student Entrepreneurial Knowledge

Unlike AI, which has a direct impact on business performance, TikTok primarily influences business outcomes through its role in knowledge dissemination. TikTok provides students with exposure to real-world entrepreneurial experiences, case studies, and digital marketing strategies, which in turn enhance their ability to operate businesses effectively (Sharabati et al., 2022; Wahid et al., 2023). Prior research suggests that the successful application of TikTok for business purposes depends on students' entrepreneurial acumen (Bhandari & Bimo, 2022).

Unlike AI, TikTok's impact on business performance is mediated by entrepreneurial knowledge. (Chen et al., 2024; Bokhari & Myeong, 2022; Saura et al., 2021; Uzir et al., 2023). This suggests that while TikTok provides exposure and outreach, its effectiveness as a business tool depends mainly on the user's strategic acumen. Students who possess strong

entrepreneurial knowledge are better able to craft compelling narratives, align content with market demand, and measure campaign effectiveness through engagement metrics (Bazi et al., 2023; Bhandari & Bimo, 2022; Sharabati et al., 2022; Zhang et al., 2021).

The nature of TikTok as a social media platform emphasizes storytelling, aesthetics, and timing. These elements require a nuanced understanding of brand identity, customer psychology, and the dynamics of trends. Students with limited knowledge may struggle to convert virality into conversion, whereas knowledgeable students can leverage TikTok to build community, foster loyalty, and drive sales. This finding is echoed in the interviews, where students with higher entrepreneurial literacy demonstrated more sophisticated TikTok strategies, including influencer partnerships, content calendars, and audience targeting (Barta et al., 2023; Bhandari & Bimo, 2022; Cuesta-Valiño et al., 2022).

Moreover, this mediation effect highlights the importance of embedding digital marketing literacy into entrepreneurship education (Kaniawati et al., 2024; Dwivedi et al., 2021; Ardiansyah et al., 2023). Teaching students how to analyze TikTok analytics, segment their audiences, and optimize video production can elevate their social media presence from amateur to professional. Such training bridges the gap between content creation and commercial value, ensuring that student businesses are not just seen but also supported by loyal customer bases (Bhandari & Bimo, 2022; Cuesta-Valiño et al., 2022; Sharabati et al., 2022).

Nonetheless, the effectiveness of TikTok also hinges on external variables such as algorithm changes, platform saturation, and shifting consumer preferences (Dwivedi et al., 2021; Saura et al., 2021). Entrepreneurial knowledge empowers students to navigate these uncertainties by diversifying marketing channels, experimenting with different formats, and maintaining brand consistency (Arsawan et al., 2022; Shaik et al., 2024; Yoopetch et al., 2021). Therefore, this study confirms that TikTok's true potential as a business enabler is unlocked only when students are equipped with a robust foundation of entrepreneurial knowledge and strategic thinking. Given this, the study hypothesizes:

H5. *Student entrepreneurial knowledge mediates the relationship between TikTok utilization and student business performance.*

3. Research Methodology

This research employs a mixed-methods case-study approach, integrating quantitative and qualitative data to gain a comprehensive understanding of the phenomenon under study (Bauer et al., 2021; Zhang et al., 2021).

Data collection was conducted through questionnaires for quantitative analysis, in-depth interviews to gain qualitative insights, and participant observation to gain a deeper understanding of the real-world context in the field (Galehdar et al., 2020; Pratt et al., 2020; Verhoeven et al., 2020). This approach enables researchers to investigate the impact of utilizing AI and TikTok on the development of entrepreneurial knowledge and skills among university students. The utilization of both quantitative and qualitative approaches ensures a multifaceted examination of the variables involved, as depicted in Figure 1. The research model illustrates the various elements that contribute to the study's framework.

- (1) Independent Variable (X): The Utilization of AI and the Utilization of TikTok
- (2) Intervening Variable (Z): Student entrepreneurship knowledge
- (3) Dependent Variable (Y): Student Business Performance

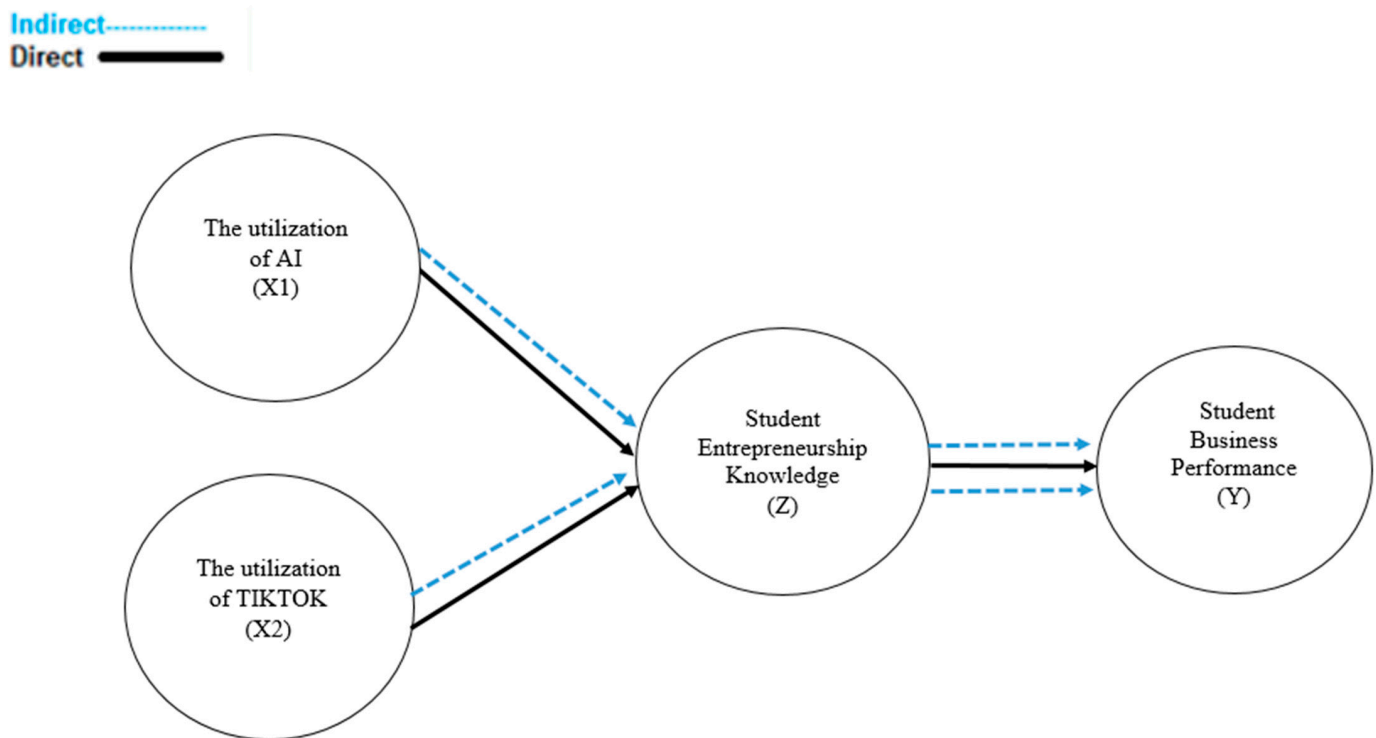


Figure 1. Research Model. Source: Data processed by researchers (2024).

The participants of this study were business students who either owned or operated a business. The inclusion criteria for participants included students who utilized digital technology in their business activities. The population of this study consisted of business students at universities that incorporated digital technology into their curricula. The sampling method employed was purposive sampling, wherein participants were selected based on specific criteria pertinent to the research objectives. The sample comprised 125 students, with three students serving as key informants for the interviews. The selection of techniques ensures that the data obtained comes from individuals who have direct experience with the use of AI and TikTok in entrepreneurship.

The research instruments employed included a Likert-scale questionnaire designed to measure students' perceptions of the use of AI and TikTok in their business activities. The research instruments in the questionnaire are shown in Table 1. In-depth interviews were conducted to explore participants' experiences and views in greater depth. At the same time, participatory observation was employed to gain firsthand insight into how these technologies are applied in entrepreneurial activities. The collection of data spanned three months, with the initial pilot test serving to guarantee the validity and reliability of the instruments; the quantitative data were analyzed using a Structural Equation Modeling–Partial Least Squares (SEM–PLS) approach with Smart PLS 4.0 software to examine the relationships between the variables being studied (Sarstedt et al., 2022).

Thematic techniques are qualitative analyses to identify patterns and themes from interview and observation data. The use of a triangulation approach aims to increase the validity of research results by comparing data from various sources. The results of this analysis are expected to provide a comprehensive picture of the impact of digital technology on students' knowledge, experience, and business performance.

Table 1. Research Variable and Survey Structure.

No.	Variable	Measurement Items
1	The Utilization of AI	The frequency with which artificial intelligence (AI) is employed in market analysis.
		The utilization of artificial intelligence in the realm of business decision-making.
		The effectiveness of artificial intelligence (AI) in enhancing operational efficiency.
		The extent of students' comprehension of artificial Intelligent technology.
		The utilization of artificial intelligence has been demonstrated to facilitate the formulation of business strategies.
2	The Utilization of TikTok	The frequency with which the social media platform TikTok is utilized for business promotion.
		The creativity exhibited in the content generated on TikTok is noteworthy.
		The present study will examine the level of interaction and engagement with TikTok content.
		The following study will examine students' perceptions of the effectiveness of the popular social media platform TikTok as a marketing tool.
		The present study will examine the comparative effectiveness of the social media platform TikTok, in contrast to other contemporary platforms.
3	Student Entrepreneurship Knowledge	A fundamental understanding of the foundational principles of effective governance in the business realm is imperative.
		It is imperative to possess a comprehensive understanding of Digital marketing strategies to ensure optimal outcomes in this field.
		A comprehensive understanding of business financial management is imperative for effective decision-making in the business realm.
		It is imperative to possess a comprehensive understanding of risk management principles and their application within the context of business operations.
4	Student Business Performance	The primary outcome of this initiative is an increase in business income.
		An increase has been observed in the number of customers.
		The degree of financial gain or loss experienced by a business entity.
		The creation or development of innovative products and services.

Source: Data processed by researchers (2024).

A detailed demographic profile of the 125 student respondents who participated in the quantitative survey is presented in Table 2. These student entrepreneurs were enrolled in undergraduate business programs across three universities and had actively managed a business for at least six months. The purposive sampling technique was used to ensure relevance to the research objectives. Most of the respondents had used at least one form of AI tool and/or TikTok for business purposes, meeting the inclusion criteria of this study. For the qualitative component, three student entrepreneurs were selected as key informants through purposive sampling to represent a variety of industries, namely fashion retail, automotive accessories, and perfume reselling. These individuals had demonstrated consistent engagement with AI tools (such as ChatGPT, Canva AI, and Meta Ads) and the TikTok platform as part of their digital marketing and operational strategies. Each interview lasted approximately 45 to 60 min and was conducted in person or via video call. Interviews were audio-recorded with consent, transcribed verbatim, and analyzed using

thematic analysis. Initial coding was followed by categorization and the identification of key themes. In addition, participatory observation was conducted by reviewing their business-related TikTok content and digital interfaces to validate the application context of the technologies discussed.

Table 2. Demographic profile of the 125 student respondents.

Demographic Variable	Category	Frequency (n = 125)	Percentage
Gender	Male	58	46.4%
	Female	67	53.6%
Age	18–21 years	36	28.8%
	22–24 years	74	59.2%
	>24 years	15	12.0%
Study Program	Business/Entrepreneurship	82	65.6%
	Marketing	28	22.4%
	Other	15	12.0%
Duration of Running Business	<6 months	22	17.6%
	6 months–1 year	53	42.4%
	>1 year	50	40.0%

Source: Data processed by researchers (2024).

4. Results

The present study’s data analysis encompasses the evaluation of both the Outer Model and the Inner Model. At the Outer Model stage, as shown in Figure 2, convergent validity ensures the factor loading values for each statement item. As demonstrated in Tables 3–6, the results indicate that all items possess a loading factor value above 0.70, suggesting high validity. Additionally, discriminant validity is assessed by comparing the Average Variance Extracted (AVE) value of each variable with the correlation between constructs. The results indicate that the AVE value of each variable exceeds the correlation with other constructs, thereby meeting the criteria for discriminant validity. Reliability tests were conducted by measuring Cronbach’s Alpha and Composite Reliability for each variable, as demonstrated in Table 4. All variables exhibited values above 0.70, suggesting good internal consistency.

Table 3. The Result of the Convergent Validity Test (loading factor).

Indicator	Outer Loadings	Description	Indicator	Outer Loadings	Description
AI1 <- AI	0.908	Valid	SBP1 <- SBP	0.730	Valid
AI2 <- AI	0.940	Valid	SBP2 <- SBP	0.878	Valid
AI3 <- AI	0.913	Valid	SBP3 <- SBP	0.870	Valid
AI4 <- AI	0.880	Valid	SBP4 <- SBP	0.832	Valid
AI5 <- AI	0.870	Valid	SEK1 <- SEK	0.887	Valid
SEK2 <- SEK	0.876	Valid	TK2 <- TK	0.870	Valid
SEK3 <- SEK	0.919	Valid	TK3 <- TK	0.885	Valid
SEK4 <- SEK	0.816	Valid	TK4 <- TK	0.940	Valid
TK1 <- TK	0.921	Valid	TK5 <- TK	0.921	Valid

Source: Smart PLS Bootstrapping’s process (2025).

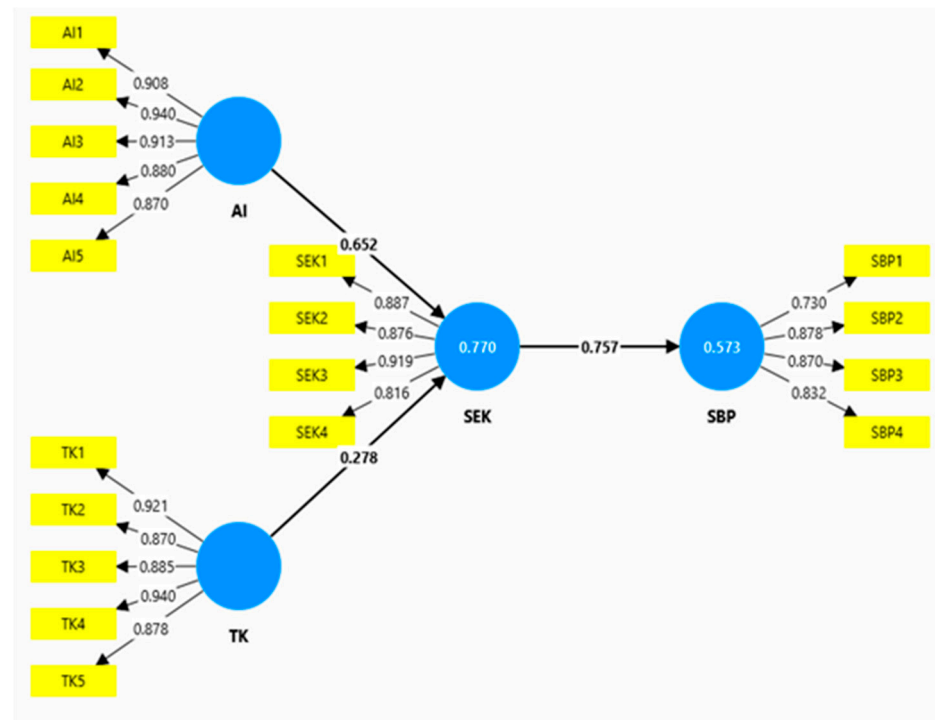


Figure 2. Outer Model. Source: Data processed by SmartPLS 4 (2025).

Table 4. The Result of the Discriminant Validity Test (Fornell-Lacker Value).

	AI	SBP	SEK	TK
AI	0.903			
SBP	0.667	0.829		
SEK	0.857	0.757	0.875	
TK	0.740	0.679	0.760	0.899

Source: Smart PLS Bootstrapping's process (2025).

Table 5. The Result of the Discriminant Validity Test (Heterotrait–Monotrait Ratio).

	AI	TK	SEK	SBP
AI	-	0.652	0.721	0.584
TK		-	0.611	0.538
SEK			-	0.685
SBP				-

Source: Smart PLS Bootstrapping's process (2025).

Table 6. Cronbach's Alpha and Composite Reliability Value.

	Cronbach's Alpha	Composite Reliability (rho_a)	Composite Reliability (rho_c)	Average Variance Extracted (AVE)	Description
AI	0.943	0.945	0.956	0.815	Reliable
SBP	0.847	0.851	0.898	0.688	Reliable
SEK	0.898	0.903	0.929	0.766	Reliable
TK	0.941	0.945	0.955	0.809	Reliable

Source: Smart PLS Bootstrapping's process (2025).

To further substantiate the discriminant validity (Fornell-Lacker) test presented in Table 5, the HTMT (Heterotrait–Monotrait Ratio) approach was employed, as delineated in Table 4. This approach was proposed by [Henseler et al. \(2015\)](#). The results of the HTMT analysis indicate that all HTMT values between constructs are below the threshold of 0.90. This finding indicates that each construct in the model possesses adequate discriminant validity. Consequently, the constructs The Utilization of AI, The Utilization of TikTok, Student Entrepreneurship Knowledge, and Student Business Performance are distinct from one another and measure different concepts, rendering them valid for use in this research model.

At the Inner Model stage, as shown in Tables 7 and 8, the adjusted R-squared analysis demonstrates that the variables “The Utilization of AI” and “the utilization of TikTok (X2)” can account for 76.5% of the variability in student entrepreneurship knowledge (Z), signifying a robust model. Conversely, student entrepreneurship knowledge (Z) accounts for 56.8% of the variability in student business performance, which is classified as a moderate model. The impact of AI utilization on Student Entrepreneurial Knowledge (Z) was reported to be substantial, with a value of 0.836, while TikTok Utilization (X2) had a moderate influence, with a value of 0.152.

Table 7. R-Square Value (R^2).

	R-Square	R-Square Adjusted
SBP	0.573	0.568
SEK	0.770	0.765

Source: Smart PLS Bootstrapping’s process (2025).

Table 8. f-Square Value (f^2).

	f-Square
AI -> SEK	0.836
SEK -> SBP	1.340
TK -> SEK	0.152

Source: Smart PLS Bootstrapping’s process (2025).

Furthermore, students’ entrepreneurial knowledge (Z) has a moderate influence on students’ business performance, with a value of 0.340. The results of hypothesis testing, presented in Table 9, which pertain to the direct effect on each variable using the bootstrapping method, demonstrate that the relationship between the utilization of AI and TikTok has a significant direct effect on student entrepreneurship knowledge (Z), with p -values of 0.000 and 0.029, respectively. Furthermore, student entrepreneurship knowledge (Z) has a significant direct effect on student business performance, with a p -value of 0.000. Mediation analysis indicates that student entrepreneurship knowledge significantly mediates the relationship between the utilization of TikTok and student business performance (p -value = 0.000) but does not mediate the relationship between the utilization of AI and student business performance (p -value = 0.063).

The findings of this study corroborate the pivotal function of leveraging artificial intelligence (AI) (X1) in amplifying student entrepreneurship knowledge (Z). This observation is consistent with the conclusions of research conducted by [Abrokwah-Larbi \(2025\)](#), which asserts that AI facilitates entrepreneurs’ ability to forecast market trends and consumer preferences by analyzing vast amounts of data, thereby empowering them to make more informed decisions and respond swiftly to market fluctuations. Moreover, the integration of AI in entrepreneurship has been shown to enhance operational efficiency and innovation,

as demonstrated by Ali et al. (2024). Their research suggests that the adoption of AI in manufacturing and distribution processes yields substantial productivity improvements. Conversely, the utilization of TikTok (X2) as a social media platform has also been shown to have a positive impact on enhancing students' knowledge of entrepreneurship (Z). The statement is supported by Wu et al. (2025), who found that promotional videos on TikTok have a significant influence on product purchase interest, with an influence level of 72.3%. This platform enables young entrepreneurs to utilize creative content in marketing their products, thereby increasing their understanding and digital marketing skills. Furthermore, this study demonstrates that student entrepreneurship knowledge (Z) exerts a moderate effect on student business performance (Y). This finding suggests that enhancing entrepreneurial understanding may facilitate more effective business management. However, the relationship between entrepreneurial knowledge and student business performance is not mediated by the utilization of AI. This may be due to the direct impact of AI on operational efficiency and innovation, obviating the need for increased entrepreneurial knowledge as an intermediary. In contrast, entrepreneurial knowledge has been shown to mediate the relationship between the utilization of TikTok (X2) and student business performance, suggesting that the use of TikTok as a marketing tool requires a sufficient level of entrepreneurial understanding to impact business performance positively.

Table 9. Hypothesis test result (direct and indirect effect).

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	p-Values
AI -> SEK	0.652	0.634	0.127	5.112	0.000
SEK -> SBP	0.757	0.773	0.074	10.203	0.000
TK -> SEK	0.278	0.302	0.127	2.186	0.029
TK -> SEK -> SBP	0.210	0.239	0.113	1.859	0.063
AI -> SEK -> SBP	0.493	0.485	0.085	5.811	0.000

Source: Smart PLS Bootstrapping's process (2025).

The final discussion employs qualitative methods to refine the mixed methods utilized in this research, as well as to complement and further explore the quantitative data collected using the previously administered questionnaire. The results of interviews conducted with three students who operate businesses in the clothing, car accessories, and perfume reselling sectors indicate that digital technology, particularly artificial intelligence, and the TikTok platform are not merely a passing trend but have evolved into a substantial business instrument with a considerable impact. The utilization of these technologies by students has been shown to enhance business efficiency, expedite the sales process, and transform the learning and understanding of entrepreneurship. When coupled with a strategic approach and a propensity to learn and adapt, digital technology emerges as a pivotal success factor for young entrepreneurs.

An analysis of recent interviews indicates that artificial intelligence (AI) has become an integral component of students' business operations, tailored to meet specific industry demands. In the clothing industry, for instance, AI is used to expedite the design process with tools like Canva AI and to generate product descriptions and captions through platforms like ChatGPT. In the automotive accessories sector, AI finds applications in AI Meta Ads to reach niche markets and in automated chatbots to enhance customer service. In the domain of perfume reselling, AI plays a role in analyzing prevailing perfume trends based on customer searches and generating more targeted advertisements. Despite the numerous conveniences offered by AI, students encounter challenges in its application. One

such challenge pertains to the cost of utilizing premium features, which often proves to be financially prohibitive for novice business owners. The qualitative findings supported the quantitative results and provided a more in-depth insight into how student entrepreneurs implement digital technologies. For example, one key informant who runs a perfume reselling business explained:

“I use ChatGPT mostly to help me draft product captions for Instagram and TikTok. It saves me time, especially when I am out of ideas, and makes my content look more professional.” (Informant A)

Additionally, the intricacies of AI functionality may not be immediately apparent to all students, necessitating the acquisition of knowledge through online tutorials or digital business communities to optimize its utilization. The creativity required in leveraging AI is another salient concern. While AI can generate novel concepts, human ingenuity remains indispensable in refining products and content to align with market expectations. This finding aligns with the Diffusion of Innovations theory, which posits that the adoption of novel technologies necessitates an adaptation process encompassing both comprehension and financial considerations (MacVaugh & Schiavone, 2010). As articulated by one of the perfume reseller students, “Initially, I encountered difficulties in comprehending the operational mechanisms of AI. However, through the utilization of the complimentary version and engagement with the digital business community, I attained a more profound understanding, enabling me to employ AI with greater efficiency.” While AI has demonstrated notable benefits, it remains imperative to recognize that its practical application necessitates the development of distinct strategies and competencies.

A recent study revealed that students who participated in interviews concurred that TikTok is the most effective platform for promoting their business. The primary rationale for this assertion is the platform’s extensive reach and its ability to generate viral content without requiring substantial financial investment. TikTok offers a variety of interactive features, including Live Shopping and Marketplace, which facilitate direct sales to potential customers. In comparison to Instagram and Facebook Ads, TikTok has been found to provide higher engagement, thereby enhancing the probability of customer acquisition at reduced marketing costs. One student, who initially relied on Shopee and Instagram for sales, reported that TikTok enabled him to reach a broader customer base, including those residing outside the immediate vicinity. This observation aligns with the findings reported by Ortiz et al. (2023), which underscores the significant influence of TikTok on customer engagement, particularly among millennials and Gen Z, who exhibit a predilection for visual and interactive marketing. However, it is essential to note that achieving success on TikTok does not depend solely on uploading videos without meticulous attention to detail.

The students identified a consistent content strategy, adherence to prevailing trends and challenges, and collaboration with influencers as pivotal factors in enhancing their marketing effectiveness. In their efforts to enhance interaction with audiences and cultivate customer trust, some students have adopted giveaway strategies and live sessions. One student shared her experience, stating, “I created a tutorial and product review on TikTok, which surprisingly garnered significant attention and resulted in sales.” Despite the evident efficacy of TikTok as a marketing tool, students have encountered challenges. One such challenge pertains to the dynamic nature of TikTok’s algorithm, which can lead to a sudden decline in the reach of previously popular videos.

Furthermore, students must continuously monitor trends and devise original content, a process that demands considerable time and effort. As one student articulated, occasionally, videos that I anticipated would achieve significant virality remain overlooked. As a result, extensive experimentation was necessary to identify the most effective strategies.

The findings align with those of [Islam et al. \(2025\)](#), who demonstrated that TikTok exhibits engagement rates 5 to 10 times higher than those of Instagram and Facebook, thereby underscoring its status as a leading digital marketing platform in the contemporary era. Another participant, who operates a small automotive accessories business, highlighted the role of TikTok in engaging with customers:

“TikTok helps me reach people I never imagined before. A single video got over 10,000 views last month, and I got more than 20 new customers from that.”
(Informant B)

Digital technology has had a profound impact on the way students manage their businesses and acquire knowledge about entrepreneurship. In the contemporary era, a significant number of students opt for learning through digital platforms, such as YouTube and TikTok, as well as online courses offered by platforms like Udemy and Coursera, and digital business communities on Telegram and Facebook. These students exhibit a preference for learning methods that are practical and can be directly applied to their business endeavors. As one student articulated, “I prefer to learn from videos or online communities. This preference is driven by the belief that such methods are more practical and immediately applicable to real-world business scenarios, as opposed to the arduous and often impractical process of reading voluminous tomes. The integration of digital technology into the business education landscape has not only transformed the way students acquire theoretical knowledge but also equipped them with practical skills. These include competencies such as copywriting for online selling, digital marketing strategies, and customer management using CRM. The contemporary paradigm of business education stands in stark contrast to the conventional methods of the past. A third informant emphasized the learning value of using these technologies:

“I learned more about marketing from using TikTok and experimenting with AI tools than I did in class. It is hands-on and directly useful for my business.”
(Informant C)

These statements exemplify how student entrepreneurs experience tangible benefits from applying AI and TikTok in their ventures, and how these tools enhance their business creativity, market reach, and confidence in decision-making.

The results of the interview demonstrate that digital technology exerts a tangible influence on the augmentation of student sales. A case in point is a student in the clothing industry who witnessed a 40% surge in sales following the implementation of artificial intelligence and the TikTok platform. Similarly, a car accessories business experienced a 50% sales growth over three months, while a perfume reseller reported a substantial increase in orders following the introduction of TikTok Shop and artificial intelligence advertisements.

These findings are consistent with [Ikpe \(2024\)](#), who reported a 30–50% faster growth rate for small businesses that adopt AI compared to those that rely on traditional methods. The study also noted a shift in students’ decision-making processes, with those previously relying on intuition now favoring data-driven approaches, automation, and more targeted digital strategies.

5. Discussion

The findings of this study reveal that AI has a significant direct influence on both entrepreneurial knowledge and business performance. At the same time, TikTok exerts its influence indirectly through its impact on entrepreneurial knowledge. These results reflect the growing relevance of digital platforms in shaping entrepreneurial outcomes among student-led ventures. This finding aligns with [Preedy and Jones \(2017\)](#), who demonstrated that the interaction between experience and practice facilitates students’

development of critical thinking and practical communication skills, which are essential prerequisites for entrepreneurial success. Students reported using AI and TikTok not merely as tools but as integral parts of their learning and business experimentation. This supports [Wahid et al. \(2023\)](#), who observed that digital-native entrepreneurs learn faster through interactive, media-rich platforms such as TikTok, gaining market knowledge from peer behaviors and customer feedback.

The result, confirming AI's direct impact on business performance, resonates with the study by [Dwivedi et al. \(2021\)](#), which found that AI-based decision-making enhances operational efficiency and personalization in marketing for small businesses. Similarly, [Rana et al. \(2024\)](#) emphasized that AI tools enhance communication accuracy and speed, thereby contributing to productivity, even in early-stage businesses such as student ventures. In contrast, TikTok's indirect impact—mediated through entrepreneurial knowledge—reflects the findings of [Islam et al. \(2025\)](#), who argued that platforms like TikTok provide experiential, observational learning rather than complex business tools. This suggests that TikTok functions more as an enabler of creativity and awareness than a direct performance booster.

5.1. Theoretical Implications

This study makes several important contributions to the theoretical discourse surrounding digital entrepreneurship and technology adoption in higher education contexts. First, the findings strengthen and extend the Technology Acceptance Model (TAM), [Venkatesh and Davis \(2000\)](#), by demonstrating that perceived usefulness and ease of use of AI and TikTok platforms are translated into actual entrepreneurial behavior and outcomes. While TAM has typically been applied in organizational or educational contexts, our findings show its relevance in early-stage entrepreneurial settings. The finding that AI exerts a direct effect on both entrepreneurial knowledge and business performance, whereas TikTok influences business outcomes indirectly through knowledge, aligns with and expands upon recent studies by [Dwivedi et al. \(2021\)](#) and [Rana et al. \(2024\)](#), who emphasized that tool functionality affects user behavior in differentiated ways.

Second, the study contributes to the Resource-Based View (RBV) theory ([Barney, 1991](#)) by conceptualizing AI tools and social media platforms as intangible but strategic resources for student entrepreneurs. In RBV, resources that are valuable, rare, inimitable, and non-substitutable can generate sustained competitive advantage. In this study, AI tools such as ChatGPT and analytics platforms, as well as creative affordances from TikTok, represent capabilities that allow students to enhance productivity, creativity, and market access even without significant capital or formal training. This echoes findings from [Wahid et al. \(2023\)](#), who argue that digital fluency is becoming a form of entrepreneurial capital for youth-led ventures in developing economies.

Third, by applying Experiential Learning Theory ([Kolb et al., 2014](#)), the study frames students' interaction with digital tools as learning-through-doing. As students engage with AI for content creation or use TikTok for market testing and feedback, they undergo iterative cycles of experience, reflection, conceptualization, and experimentation. Qualitative insights in this study were obtained by informants using ChatGPT 3.5 with promotional language or TikTok to observe market reactions and demonstrate this learning cycle in action. This supports and extends prior work by [Mandrup and Jensen \(2017\)](#), who noted that entrepreneurial skill development often emerges more powerfully from real-world interaction than from classroom instruction alone.

Finally, this study offers a nuanced contribution to mediated impact models in digital entrepreneurship. The fact that TikTok's influence on business performance is fully mediated by entrepreneurial knowledge suggests that not all technologies exert direct effects.

Instead, specific platforms may serve primarily as *learning catalysts*, while others function as performance drivers. This distinction contributes to ongoing discussions in the literature on digital entrepreneurship pedagogy (Islam et al., 2025) by highlighting that future models should incorporate constructs such as digital competence or cognitive absorption as mediating variables. The implication is that theoretical models of digital entrepreneurship must evolve to capture these layered mechanisms of technological influence.

5.2. Practical Implications

The findings of this study offer several actionable insights for higher education institutions, particularly those seeking to modernize entrepreneurship education in response to the digital transformation of business practices. The integration of AI and social media platforms like TikTok into student ventures underscores the need to restructure entrepreneurship curricula to include experiential learning with digital tools. As shown in this study, student entrepreneurs benefit from using AI for ideation, drafting, and analytics, while TikTok helps expand their digital marketing capabilities. Educational institutions should incorporate hands-on modules involving AI-assisted decision-making tools and short-video content creation to cultivate these skills (Dwivedi et al., 2021; Kolb et al., 2014).

Second, faculty and curriculum designers should recognize the digital behavior gap that exists between students and institutions. The 2024 Global AI Student Survey indicated that 58% of students feel underprepared in AI competencies, and 80% are dissatisfied with their university's integration of AI into learning. Institutions can respond by offering structured training on AI tools, responsible use of generative AI, and practical social media strategy. These training programs should not be generic workshops but embedded within business projects, business plan competitions, or startup incubation tracks, where the tools are used in authentic entrepreneurial contexts (Wahid et al., 2023; Islam et al., 2025).

Third, universities should support student-led ventures through entrepreneurial incubators and digital sandboxes, where experimentation with AI and platforms like TikTok can take place safely, with mentorship. For instance, students should be guided to analyze customer engagement on TikTok through real-time analytics or to A/B test AI-generated marketing content. Business schools can also partner with technology providers to give students access to premium versions of AI tools or campaign testing software. This environment would enable students to develop critical digital competencies that are directly applicable to business operations and customer interaction (Rana et al., 2024).

Lastly, these findings also carry implications for policymakers and national-level education strategists. Beyond individual institutions, national education frameworks should formally recognize digital entrepreneurship as a key pillar of 21st-century education. This includes not only technical literacy but also ethical and strategic dimensions of AI use, digital content monetization, and platform-based branding. Policymakers may consider incentives for digital entrepreneurship initiatives, competitive digital entrepreneurship grants, or curricular accreditation that includes AI/TikTok-based projects. These structural supports would ensure the scalability of digital entrepreneurial learning and narrow the skills gap between academic instruction and market demands.

6. Conclusions

This study finds that the integration of artificial intelligence (AI) into educational curricula has a substantial and direct impact on enhancing students' entrepreneurial knowledge. Conversely, the incorporation of the social media platform TikTok has a moderate influence on entrepreneurial knowledge, which is itself a significant predictor of students' business performance. These findings suggest that educational institutions should consider incorporating AI technology into entrepreneurship curricula to enhance efficiency and

innovation. Furthermore, educational institutions may consider integrating training on the effective use of social media platforms, such as TikTok, to enhance students' digital marketing strategies, emphasizing the pivotal role of entrepreneurial understanding in maximizing the potential of these platforms.

This study examined the impact of digital technology utilization—specifically Artificial Intelligence (AI) and TikTok—on the entrepreneurial knowledge, business experience, and business performance of student entrepreneurs. By employing a mixed-method approach, the research revealed that AI has a direct and significant impact on both entrepreneurial knowledge and business performance. At the same time, TikTok exerts an indirect influence through its effect on entrepreneurial learning. The integration of qualitative insights strengthened the understanding of how students practically adopt and leverage these technologies in real business contexts. The study highlights the evolving role of digital tools in shaping entrepreneurial behavior within higher education environments.

The findings contribute to the theoretical development of digital entrepreneurship by integrating insights from Experiential Learning Theory, the Resource-Based View, and the Technology Acceptance Model. These theoretical lenses helped to explain how students not only adopt but also internalize the value of digital tools in entrepreneurial decision-making, marketing execution, and innovation strategies. This research provides empirical evidence that student-led ventures can significantly benefit from structured digital engagement, mainly when supported by adequate digital literacy and institutional guidance.

Despite its contributions, this study has several limitations. First, the sample was limited to student entrepreneurs currently enrolled in undergraduate programs from a specific geographic and institutional scope, which may constrain the generalizability of the findings. Second, the research focused exclusively on two digital technologies—AI and TikTok—while other potentially influential platforms, such as Instagram Reels, WhatsApp Business, or Canva AI, were not considered. Third, contextual variables such as gender-based entrepreneurial preferences or differences in digital behavior between urban and rural areas have not been explicitly explored, which may limit a deeper understanding of variations in usage patterns. These limitations should be acknowledged when interpreting the results and positioning them within broader academic discourse.

Given these limitations, several directions for future research are recommended. First, future studies could expand the demographic and contextual scope by including entrepreneurs beyond the student population, such as early-stage founders, freelancers, or micro-entrepreneurs. Comparative studies across different universities, countries, or socio-economic backgrounds could also reveal new insights into digital adoption patterns. Second, subsequent research could incorporate a wider array of digital tools, including emerging platforms, to assess their comparative impact on various entrepreneurial competencies. A longitudinal approach may also help measure how the influence of digital tools evolves as student entrepreneurs gain more experience.

Ultimately, future research should examine the role of external and institutional enablers, including the availability of structured training, university-led incubators, and national digital literacy policies. These factors may act as moderators or mediators in the relationship between digital tool adoption and entrepreneurial performance. Moreover, qualitative explorations of institutional readiness or cultural acceptance of digital entrepreneurship can offer valuable dimensions to complement quantitative findings. In doing so, future research can contribute not only to academic theory but also to the design of more effective educational and entrepreneurial support systems.

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Abbreviation

Variables	Definition
AI	The replication of human intelligence in machines that can learn, reason, and make decisions to improve business efficiency and market analysis.
TK	The utilization of the TikTok social media platform for business promotion, marketing strategies, and entrepreneurial education.
SEK	Students acquire knowledge in business principles, market analysis, financial management, and marketing strategies to improve their entrepreneurial decision-making skills.
SBP	The measurable success of student-run businesses includes revenue growth, customer acquisition, and overall business sustainability.

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