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A Review on Determinants Affecting Commercialization of Academic Institution Final Year Projects

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ABSTRACT

Final year project is an important training and assessment component incorporated in many courses of academic institution. The ability to translate ideas, research, and creativity into actual products, services, or businesses shows how successful and impactful people or institutions can be in the wider economy. However, in most of the cases, the outcomes of the final year project usually remain as academic discussion without maximizing their potential to be converted into a commercialized product or services. In this review, theory and applications are discussed to understand how entrepreneurial skills and networking abilities, components of individuals' human capital can impact the commercialisation of final year projects. Furthermore, determinants affecting commercialization of final year projects will also be explored namely: entrepreneurial skills, networking ability, access to resources, institutional support as well as creativity and innovation.

Keyword: Commercialization; Final Year Projects; Entrepreneurship; Institution Support; Network; Resources

1. Introduction

In the new era that filled with new ideas and desire to start new businesses, turning final year projects

into real-world commercial products or services is now a key bridge between education institute and the commercial world (Biancone et al., 2022). The ability to translate ideas, research, and creativity into

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actual products, services, or businesses shows how successful and impactful people or institutions can be in the wider economy.

The contemporary educational and entrepreneurial spheres have undergone a paradigm shift, wherein the traditional academic exercise—final year projects—now holds significant potential for commercial viability. This evolution underscores the increasing acknowledgment of entrepreneurship and innovation as not merely academic concepts but as practical strategies for converting knowledge and ideas into marketable assets (Weking et al., 2018). Final year projects doesn't just confined to classroom activities, but they are treated as innovation laboratories, enabling students and researchers to integrate theoretical concepts with practical applications.

The imperative to investigate the commercialisation of final year projects emerges from a convergence of factors. Educational institutions are giving a lot of emphasis on cultivating the entrepreneurial mindsets and equipping students for the evolving demands of the contemporary workforce. Simultaneously, entrepreneurs and innovators aim to harness academic insights and research findings to propel their ventures. This convergence highlights the critical importance of comprehending the factors that facilitate or impede the commercialisation of final year projects and the potential moderating influence of socioeconomic and education-related disparities (Hicks & Ison, 2018).

2. Education systems in China to support Movies and Arts Industry

In the new era of education systems in China, academic institutions are putting efforts nurturing talent for the film and arts industry. China's dedication to fostering artistic excellence is demonstrated through its specialized educational institutions, such as the Central Academy of Fine Arts, Beijing Film Academy, and Shanghai Theatre Academy. These institutions provide comprehensive programs that span diverse artistic disciplines, including film, visual arts, theatre, music, and dance. Students admitted to these esteemed academies undergo rigorous training

that integrates the development of technical skills with artistic expression, thereby equipping them with a robust foundation for careers in the creative sector (Guan, 2023).

A notable aspect of China's arts education is the integration of arts and culture into the mainstream curriculum beginning at the primary education level. This comprehensive approach introduces students to music, painting, calligraphy, and other forms of artistic expression as part of their general education. By incorporating the arts early in a student's academic journey, China seeks to foster an appreciation for creativity and cultural heritage while identifying and nurturing emerging artistic talents (Zheng, 2021). Furthermore, China has established specialized high schools dedicated to cultivating creative talents, providing intensive training in dance, music, drama, and visual arts. Admission to these schools is highly competitive, with students selected based on exceptional aptitude and talent. Once admitted, students receive advanced education and training focused on refining their artistic skills and enhancing their prospects in the film and arts industry (Zaheer et al., 2022).

The Chinese education system actively promotes arts and cultural activities through various festivals, competitions, and exhibitions across different educational levels. These events provide platforms for students to showcase their talents, gain exposure, and receive recognition for their creative endeavors. Educational institutions encourage and support participation in such activities, fostering a vibrant arts community within China (Yao et al., 2023). Financial support is another critical component of China's commitment to arts education. Both the government and private organizations offer scholarships and financial aid programs to talented students pursuing careers in the arts. These initiatives help alleviate financial barriers, making arts education accessible to a broader population and ensuring that gifted students can pursue their artistic passions (Wujarso, R., & Dameria, 2023).

In recent years, Chinese art education has integrated technological advancements, incorporating

digital media, animation, and computer-generated imagery (CGI) into the curriculum. This progressive approach equips students for the evolving landscape of the film and arts industry, which increasingly relies on technology and digital platforms for artistic expression and distribution. Additionally, many Chinese art institutions actively collaborate with industry stakeholders, such as film studios, theaters, and art galleries. These partnerships offer students real-world exposure, internships, and networking opportunities, bridging the gap between education and industry practice and facilitating a seamless transition for graduates into professional roles within the film and arts sector (Lee et al., 2021).

While emphasizing innovation and contemporary art forms, China's art education system also places great importance on preserving and promoting traditional arts and cultural heritage. This includes cultivating classical Chinese painting, calligraphy, traditional music, and Peking opera. These traditions are considered as an integral part of China's rich cultural heritage, and their preservation ensures the continuity of centuries-old artistic practices. Additionally, Chinese arts institutions have increasingly promoted international exchange programs. These programs facilitate student learning and collaboration with artists and educators worldwide. Students gain a global perspective that enhances their understanding of the broader artistic landscape by engaging with diverse artistic styles and practices (Hung et al., 2021).

Chinese culture is deeply embedded in the arts education curriculum. Students learn about the philosophical underpinnings of Chinese art, including concepts such as Confucianism, Taoism, and Zen Buddhism, which have influenced artistic expression for centuries. Incorporating cultural elements provides a profound understanding of Chinese culture and informs contemporary artists' creative work, enabling them to draw upon their cultural roots. China's art education system recognizes the importance of blending traditional and modern artistic forms. While preserving classical traditions, it encourages students to explore contemporary and innovative approaches to art. This fusion allows students to bridge the gap

between tradition and modernity, fostering a dynamic and evolving artistic landscape (Hutchison & McAlister-Shields, 2020).

China actively promotes its cultural heritage through arts education. This includes disseminating traditional art forms through student performances, exhibitions, and cultural festivals. By actively engaging students in presenting and preserving their cultural heritage, China ensures these traditions remain vibrant and relevant in the contemporary world. Many arts institutions in China integrate traditional arts with modern disciplines. For example, students studying digital media or animation may incorporate conventional Chinese themes and techniques into their work. This fusion of old and new allows for the creation innovative and culturally rich art forms that appeal to a global audience (Perry, 2020).

Arts education in China follows a master-apprenticeship model, where students work closely with established artists and practitioners. This hands-on approach allows students to learn traditional arts directly from masters, ensuring the transmission of knowledge and skills from one generation to the next. Chinese language and literature are integral components of arts education (Wang, 2020). Students are encouraged to explore classical Chinese literature, poetry, and philosophy, as they provide a deep well of inspiration for artistic expression. This linguistic and literary foundation enriches students' creative work and deepens their cultural understanding. China actively promotes cultural exchange programs that allow students to engage with international artistic communities. These programs enable students to learn from and collaborate with artists worldwide, fostering cross-cultural understanding and enriching their creative perspectives (Hutchison & McAlister-Shields, 2020).

3. Underlying Theories

Human Capital Theory emphasizes that individuals' skills, knowledge, and abilities are valuable assets that contribute significantly to their success in various endeavors, including entrepreneurship. In this review, theory and applications are discussed to

understand how entrepreneurial skills and networking abilities, components of individuals' human capital can impact the commercialization of final year projects. It is suggested that individuals with more vital entrepreneurial skills and practical networking abilities are better equipped to navigate the commercialization process successfully (Werdhiastutie et al., 2020).

The Resource-Based View (RBV) Theory is particularly relevant when examining the role of access to resources in the commercialisation of final year projects. This theory explains that a project has a more competitive advantage when they have access to unique and valuable resources that are difficult for competitors to replicate (Zahra, 2021).

3.1 Human Capital Theory (HCT)

HCT is a fundamental concept in economics particularly labour economics, shedding light on the inherent value of an individual's knowledge, skills, education, experience, and competencies. It suggests that these attributes, collectively referred to as human capital, are critical determinants of an individual's economic success and the prosperity of a society. At its core, this theory emphasises that individuals are not just labour inputs but reservoirs of valuable intellectual and practical assets that can be cultivated and enhanced through education, training, and personal development (Wright, 2021).

A central premise of HCT is that investments in human capital lead to increased productivity and earning potential. Education and training are recognised as important mechanisms for augmenting human capital. Through formal education, individuals acquire theoretical knowledge and practical skills that can be directly applied in the workforce (Fix, 2018). This heightened competence renders them more productive and marketable, resulting in higher wages and greater access to desirable job opportunities. Furthermore, HCT underscores that human capital is not static but dynamic and continuously evolving. As individuals accumulate experience and adapt to the changing demands of the labour market, their human capital appreciates. This implies that lifelong

learning, skill upgrading, and acquiring new competencies are paramount in a world where technology and industries are in constant flux (Wujarso & Dameria, 2023).

HCT holds significant relevance in research on the commercialization of final year projects. It helps elucidate how the possession and enhancement of specific entrepreneurial skills and networking abilities are integral components of an individual's human capital and can profoundly impact the success of commercial endeavors. Commercialization heavily relies on entrepreneurial abilities, including discovering possibilities, taking measured risks, innovating, and adapting (Jafari-Sadeghi et al., 2020). Individuals who are equipped with these skills have the advantage to navigate the complex and uncertain terrain of bringing a project to market. Additionally, networking abilities, encompassing relationship-building, information access, and resource mobilization, are facets of an individual's human capital that play a pivotal role in commercialization. Effective networking can open doors to crucial partnerships, funding opportunities, and market insights, all of which can significantly influence the outcomes of entrepreneurial projects (Mkhize, 2018).

At its core, HCT advances the notion that individuals are not passive factors of production but rather active agents who can enhance their economic well-being through strategic investments in their human capital. These investments encompass formal education, on-the-job training, skill acquisition, and experiential learning. Central to the theory's purview is that such investments culminate in heightened productivity and enhanced earning potential, substantiating an individual's economic prosperity and societal advancement (Bratton et al., 2021).

The evolution of HCT is characterized by its expanding purview, transcending the sole focus on the direct relationship between education and earnings. Contemporary interpretations acknowledge that human capital encompasses a broader spectrum of attributes, encompassing skills, competencies, health, and social capital—denoting the value accrued from an individual's social networks and interpersonal rela-

tionships. This comprehensive framework collectively informs an individual's capacity to contribute to economic growth and societal development (Sellar & Zipin, 2019).

Within the context of the research under consideration, which pertains to the commercialization of final year projects, HCT assumes an important role in elucidating the mechanisms whereby entrepreneurial skills and networking abilities can bring a favorable outcomes (Burbano et al., 2018). Entrepreneurial skills, including creativity, risk propensity, and adaptability, align closely with the construct of human capital. Individuals who proactively cultivate and augment these skills are better equipped to discern opportunities, surmount challenges, and foster innovation—all salient components underpinning the commercialization process.

Simultaneously, the theory underscores the significance of networking abilities as integral facets of human capital, encapsulating the development and mobilization of social capital (Aquino et al., 2018). Proficient networking furnishes individuals with access to valuable resources, information, and opportunities that fortify their capacity to successfully navigate the labyrinthine landscape of commercializing final year projects. By acutely recognizing the centrality of human capital in comprehending the roles of entrepreneurial skills and networking proficiencies, this research contributes cogently to exploring how investments in these domains configure the outcomes of projects marked by commercial intent (Wright et al, 2022).

3.2 Resource-Based View (RBV) Theory

RBV theory is a fundamental concept in strategic management and economics, providing a crucial framework for understanding how firms or organizations achieve and maintain competitive advantage. Central to RBV theory is the proposition that an organization's success and performance are primarily determined by its unique and valuable resources and capabilities. These resources encompass both tangible assets, such as physical infrastructure, technology, and financial capital, and intangible assets,

including intellectual property, brand reputation, and organizational knowledge (Donnellan & Rutledge, 2019).

One of the fundamental tenets of RBV theory is that not all resources are created equally (Alexy et al., 2018). Some resources are more valuable and rarer than others, and they can provide a sustainable competitive advantage. VRIN resources, which include helpful, rare, difficult-to-copy, and non-substitutable resources, are widely recognized as the most strategically important assets. These resources enable organizations to differentiate themselves from competitors and create barriers to entry, making it challenging for other firms to replicate their success.

RBV theory emphasizes that firms should identify and develop unique, inimitable resources and capabilities. It suggests that competitive advantage arises when organizations leverage these resources to create superior products, services, or processes. Furthermore, the theory underscores the dynamic nature of resource development, highlighting the importance of continuous investment, learning, and adaptation to remain competitive in a changing business environment (McGahan, 2021).

RBV theory can be applied to examine the role of access to resources in the success of final year projects. Resources, such as funding, specialized equipment, research facilities, or exclusive partnerships, are crucial assets that can significantly impact commercialization. RBV theory suggests that projects or organizations with access to unique and valuable resources may enjoy a competitive advantage in bringing their projects to market. Moreover, RBV theory can help us understand how the scarcity and strategic deployment of resources can create barriers to entry for potential competitors in the commercialization landscape. For instance, if a final year project has access to cutting-edge technology or exclusive partnerships, it may be better positioned to seize market opportunities and fend off competition (Wang et al., 2020).

At its core, RBV theory asserts that an organization's success is contingent upon the distinctive nature, value, inimitability, and irreplaceability of its

resources and capabilities. The theoretical origins of RBV can be traced to Wernerfelt (1984), who conceptualized firms as collections of resources, thus establishing the groundwork for subsequent scholarly exploration of the theory's complexities. A notable advancement in RBV theory was achieved by Barney (1991), who expanded upon Wernerfelt's framework by introducing the VRIN model. This model highlights the strategic importance of resources that are Valuable, Rare, Inimitable, and Non-substitutable. Barney's contributions provided a systematic framework for both researchers and practitioners to evaluate the strategic value of resources in achieving and sustaining competitive advantage (Alexy et al., 2018).

The literature surrounding RBV theory has witnessed substantial growth, encompassing resource heterogeneity, immobility, dynamic capabilities, and competitive positioning. Scholars have also extended their exploration of resources to industry and network levels, underscoring the theory's adaptability across diverse contexts. Empirical studies rooted in RBV theory have explored various initiatives and organizational settings, investigating the role of specific resources like intellectual property, organizational knowledge, technological assets, and human capital in shaping competitive advantage (El Daly, 2020).

In the context of entrepreneurial ventures, RBV theory has offered valuable insights into how startups and small businesses can leverage their resource base to compete effectively in dynamic markets. For instance, RBV theory has been applied to understand how access to unique resources, including entrepreneurial skills, networks, and specialized knowledge, can enable startups to establish niches and disrupt established industries (Wang et al., 2020).

RBV Theory is a seminal strategic management framework. It offers a robust perspective on the critical role of resources and capabilities in driving competitive advantage. Its historical development, conceptual evolution, and empirical applications have deepened our understanding of how organizations, including entrepreneurial ventures, can strategically manage their resource base to achieve sustained suc-

cess in competitive and dynamic environments (Helfat et al., 2023).

4. Project Commercialisation

Project commercialization is a multifaceted concept transforming a project, often from research, innovation, or creative endeavors, into a commercial product, service, or venture to generate economic value (Davies et al., 2018). This process represents the bridge between creativity and market realization, where the outputs of a project are strategically positioned and executed to achieve tangible financial and societal benefits.

Project commercialization involves recognizing a project's potential to meet market needs or solve specific problems (Andoni et al., 2019). It involves identifying market opportunities, targeting customer segments, and formulating a comprehensive commercialization strategy. This strategy typically addresses crucial aspects such as product development, marketing, funding acquisition, intellectual property protection, and distribution channels.

Project commercialization is not confined to the business sector alone. It is equally relevant in academic, scientific, and technological domains. In academia, for instance, it refers to translating research findings, inventions, or educational materials into tangible outcomes that can be disseminated, adopted, or monetized. In this context, it bridges the gap between academic knowledge and practical application, facilitating knowledge transfer to society (Newman et al., 2021).

Networking abilities are essential for successful project commercialization. Entrepreneurs with robust networking skills excel at cultivating relationships that grant access to financial capital, strategic partnerships, mentorship, and other critical resources. These connections serve as conduits for resource mobilization, enabling entrepreneurs to acquire the necessary assets for project advancement. Access to resources is a fundamental component of project commercialization, encompassing financial capital, technology, human resources, and social networks (De Sousa et al., 2019). Financial capital, in partic-

ular, functions as the lifeblood of commercialization efforts, facilitating investments in product development, marketing, and scaling activities. Furthermore, access to technology and human capital accelerates innovation and product development, while social networks foster collaboration and the establishment of strategic partnerships.

Successful project commercialization depends on how well resources are managed. Entrepreneurs need to use their resources wisely to achieve the best results. This requires careful decision-making, the ability to adapt to market changes, and ongoing innovation to improve products and stay competitive. However, the commercialization process comes with challenges, such as limited resources, market uncertainties, and competition. Access to institutional support is crucial in overcoming these challenges. Support from institutions can offer mentorship, financial aid, and networking opportunities, which help reduce obstacles and make the commercialization process smoother.

5. Determinants of Project Commercialisation

5.1 Relationship between Entrepreneurial Skills and Project Commercialisation

Entrepreneurial skills, often called entrepreneurial competencies or capabilities, constitute a set of essential attributes, behaviors, and knowledge that individuals or entrepreneurs employ in identifying, creating, and capitalizing on business opportunities. These skills are pivotal in initiating, managing, and scaling entrepreneurial ventures, ranging from startups and small businesses to innovative projects within larger organizations. Entrepreneurial skills encompass many competencies that empower individuals to navigate entrepreneurship's dynamic and uncertain landscape successfully (Hanson, 2021).

At its fundamental, entrepreneurial skills are about finding and evaluating opportunities. Entrepreneurs are good at spotting market trends, unmet needs, and gaps that can be filled with innovative ideas. They use their creativity and problem-solving

abilities to come up with new products, services, or business models that can change existing markets or create new ones. In addition, strong communication and networking skills are essential for entrepreneurs. They need to clearly share their vision, persuade others, and build relationships with partners, customers, investors, and other important people in the business world. These skills help them attract resources, secure funding, and form strategic partnerships to advance their ventures (Shkabatur et al., 2022).

The exploration of the interplay between entrepreneurial skills and project commercialization is a crucial area of inquiry in the field of entrepreneurship. This review delves deeper into the multifaceted relationship between these two key aspects, highlighting the nuanced ways entrepreneurial skills influence the successful transformation of innovative ideas into viable and profitable ventures. Entrepreneurial skills are widely acknowledged as catalysts for project commercialization (Jafari-Sadeghi et al., 2020). These skills encompass a range of competencies, including creativity, risk-taking, opportunity recognition, problem-solving, and effective communication. These competencies empower entrepreneurs to identify potential market opportunities, develop innovative solutions, and adeptly navigate the myriad challenges of commercialisation. Creativity, in particular, plays a central role in the ideation phase, driving the generation of novel concepts that form the basis of commercial ventures. Risk-taking and problem-solving skills enable entrepreneurs to make informed decisions, adapt to unforeseen obstacles, and pivot when necessary.

The influence of entrepreneurial skills on decision-making cannot be overstated. Entrepreneurship is inherently fraught with uncertainty, and skilled entrepreneurs possess the understanding to make calculated decisions in ambiguous and dynamic environments. A deep understanding of the market, competitive landscape, and potential outcomes temper their risk-taking propensity. This skill set empowers them to make strategic choices throughout the commercialisation journey, from market entry strategies to resource allocation and adaptation to shifting mar-

ket dynamics (Chang and Chen, 2020).

Entrepreneurial skills, especially networking abilities, play a big role in resource mobilization, which is key for the success of project commercialization. Skilled entrepreneurs are good at building and using professional networks to get financial support, strategic partnerships, mentorship, and other important resources. Effective networking is more than just making contacts; it involves creating relationships that offer valuable support and opportunities. Entrepreneurs with strong networking skills are better at getting the resources needed to grow and scale their projects (Densford et al., 2018).

Entrepreneurial skills also help with adaptability and innovation, which are essential for project commercialization. Entrepreneurship is a dynamic field, and skilled entrepreneurs can adapt to market changes, customer preferences, and new technologies. Their ability to innovate helps them create unique ideas and stand out in a competitive market. Being able to constantly adapt and innovate is crucial for ensuring that commercialized projects are successful and sustainable in the long term (Biancone et al., 2022).

The relationship between entrepreneurial skills and project commercialization is not static but instead dynamic and evolving. Entrepreneurial skills develop through experiential learning and are honed through entrepreneurial experiences. Entrepreneurs' skills continually adapt and mature as they progress along the commercialization pathway. This evolution influences the project's trajectory, impacting its ability to overcome challenges and seize opportunities. Therefore, developing entrepreneurial skills is an ongoing process contributing to the project's success. The relationship between entrepreneurial skills and project commercialization is indeed dynamic and evolving, characterized by continuous development and adaptation. Entrepreneurial skills are not static attributes but rather abilities that grow and refine over time, primarily through experiential learning and the challenges encountered during entrepreneurial journeys. This dynamic evolution of skills has a profound impact on the trajectory of a project, influ-

encing its ability to navigate obstacles and capitalize on opportunities throughout the commercialization process (Ayodele et al., 2021).

5.2 Relationship between Networking Abilities and Project Commercialisation

Networking abilities, often networking skills or capabilities, are critical interpersonal and professional competencies that enable individuals to establish, cultivate, and leverage relationships with others in various personal and professional contexts. These abilities facilitate the exchange of information, resources, and opportunities and play a pivotal role in building a diverse and influential network of contacts. Networking abilities encompass various skills, behaviours, and strategies that empower individuals to connect, communicate, and collaborate effectively with others (Saikouk et al., 2021).

Networking involves the art of building and nurturing relationships. Networking abilities encompass the capacity to initiate and maintain meaningful connections with diverse individuals, including peers, colleagues, mentors, clients, partners, and industry leaders. Effective networkers possess the skills of active listening, empathy, and a genuine interest in others, which form the foundation for building trust and rapport. Effective communication is a cornerstone of networking abilities. Networking encompasses not only the ability to articulate one's own goals, ideas, and value propositions clearly but also the capacity to listen attentively to the needs, challenges, and aspirations of others. Effective communicators can engage in mutually beneficial conversations, convey their intentions persuasively, and adapt their communication style to different audiences and contexts (Arici & Uysal, 2022).

The link between networking abilities and project commercialization is an important area of study in entrepreneurship and innovation. This review explores how networking skills help turn new ideas into successful projects by looking at the many ways these skills contribute to commercialization. Networking abilities are seen as valuable resources for entrepreneurs and innovators. Effective networking

means creating and maintaining professional relationships that offer access to important resources like financial support, mentorship, market knowledge, and opportunities for collaboration. By building and managing these networks, entrepreneurs can get the resources they need to develop and commercialize their projects (Biber et al., 2021).

Networking abilities are central to resource mobilization, a pivotal determinant of project commercialization success. Entrepreneurs with robust networking skills excel in forging connections with potential investors, strategic partners, industry experts, and mentors. These connections are conduits for accessing financial support, industry-specific knowledge, and guidance during commercialization. Resource mobilization through networking is not limited to financial capital but extends to other vital resources, including intellectual and social capital (Ullah et al., 2023).

Networking enhances entrepreneurs' access to knowledge, expertise, and industry insights, invaluable assets in project commercialization. By engaging with diverse individuals and organizations, entrepreneurs gain access to information about market trends, emerging technologies, consumer preferences, and competitive dynamics. Such insights enable entrepreneurs to make informed decisions, refine their value propositions, and adapt to changing market conditions. Networking abilities are instrumental in forging strategic alliances and partnerships that can catalyze project commercialization. Collaborative arrangements with complementary firms or organizations can provide access to distribution channels, customer bases, and shared resources (Guillory, 2020). These alliances can accelerate the commercialization process by leveraging the strengths of multiple stakeholders and mitigating risks.

Effective networking goes beyond making individual connections; it involves engaging with the wider entrepreneurial ecosystem. Entrepreneurs who actively participate in industry events, join entrepreneurial communities, and use innovation hubs are better at finding new opportunities and staying updated on industry trends. This involvement helps

create a supportive environment for project commercialization (Shan and Shan, 2023).

Networking is also closely tied to building trust and a strong reputation. Entrepreneurs who develop and maintain solid professional relationships tend to earn trust from peers, investors, and other stakeholders (Zaheer et al., 2022). A good reputation enhances credibility and can help entrepreneurs access resources and form partnerships that are crucial for successful project commercialization.

5.3 Relationship between Access to Resources and Project Commercialisation

Access to resources, a central concept in various domains such as business, entrepreneurship, economics, and social development, refers to the ability of individuals, organizations, or entities to obtain and utilize the essential assets, capabilities, or means required to achieve specific goals, objectives, or outcomes. These resources can encompass a wide range of tangible and intangible assets, including but not limited to financial capital, physical infrastructure, human expertise, technology, information, and networks. The concept of access to resources is fundamental to understanding how opportunities are leveraged and challenges are addressed across diverse contexts (Werdhiastutie et al., 2020).

Financial capital is one of the primary dimensions of resource access. Adequate access to financial resources, such as funding, investment, or credit, is often critical for individuals and organizations to initiate and sustain various endeavors. Whether it involves launching a business, implementing a project, or pursuing educational goals, financial resources are the fuel to turn aspirations into reality. Moreover, equitable access to financial resources is integral to addressing socioeconomic disparities and promoting economic inclusion. Physical infrastructure and facilities constitute another aspect of access to resources. This includes access to well-maintained transportation systems, communication networks, educational institutions, healthcare facilities, and public services. Physical infrastructure plays a vital role in supporting economic development, enhancing quality of

life, and facilitating the efficient movement of goods, services, and people (Peng et al., 2019).

The relationship between access to resources and project commercialization is a key topic in entrepreneurship research. This review explores how access to resources helps turn new ideas into successful and lasting businesses. Having access to resources is the foundation for successful project commercialization. Resources such as financial capital, technology, physical infrastructure, skilled people, and social connections are essential for commercializing projects. The ability to obtain and use these resources effectively is crucial for starting, developing, and growing commercial ventures (Chang and Chen, 2020).

Among these resources, financial capital is the most important for commercializing projects. Having access to different types of funding, like venture capital, angel investors, loans, and grants, is crucial for product development, marketing, operations, and entering the market. A strong financial base helps entrepreneurs deal with the uncertainties and challenges of commercialization (Densford et al., 2018). In the digital age, access to advanced technology and good infrastructure is also essential. Innovations often depend on the latest tools, equipment, and platforms for developing and delivering products. Entrepreneurs who have access to these advanced technologies and resources can speed up their project development and growth, giving them a competitive advantage (d'Armagnac et al., 2022).

Human capital, embodied in skilled talent and expertise, is a linchpin in project commercialization. Access to a skilled workforce, domain-specific knowledge, and diverse skill sets are instrumental for executing commercialization strategies effectively. A proficient team can drive innovation, adapt to market shifts, and ensure the high-quality development of projects. Social capital, comprising relationships, networks, and collaborations, forms a vital conduit for resource access. Entrepreneurs who cultivate rich social capital can leverage professional connections to secure financial support, forge strategic alliances, and glean valuable insights. These social networks

facilitate resource mobilization and provide crucial support throughout the commercialization journey (d'Armagnac et al., 2022).

Access to detailed market knowledge and consumer insights is crucial for making smart decisions during commercialization. Entrepreneurs who have strong market research, customer feedback, and competitive information can adjust their strategies, improve their value propositions, and develop better market entry plans. This informed approach increases the chances of successful commercialization. The range of resources available can also affect commercialization outcomes. Having a mix of financial, technological, and human resources provides flexibility and helps entrepreneurs adapt to market changes and unexpected challenges. Interestingly, a lack of resources can sometimes boost entrepreneurial creativity. When resources are scarce, entrepreneurs often come up with creative ways to manage them, such as using limited funds wisely or forming partnerships. This scarcity can lead to innovative solutions for overcoming resource shortages (Helfat et al., 2023).

Access to comprehensive market knowledge and consumer insights indeed plays a pivotal role in informed decision-making throughout the commercialization process. Entrepreneurs armed with robust market research, feedback from customers, and competitive intelligence are well-equipped to tailor their strategies, refine value propositions, and optimize their approaches to entering the market. This informed decision-making not only mitigates risks but also elevates the prospects of successful commercialization. Comprehensive market knowledge is akin to a compass that guides entrepreneurs on their commercialization journey. Understanding market trends, customer preferences, and the competitive landscape empowers entrepreneurs to make strategic choices that are in sync with market dynamics. Armed with consumer insights, entrepreneurs can develop products or services that resonate with their target audience, fine-tune their marketing efforts, and anticipate changing consumer demands (Khanra et al., 2022).

Diversity in accessible resources is another critical factor influencing commercialization outcomes. A well-rounded portfolio encompassing financial, technological, and human resources provides entrepreneurs with flexibility and adaptability. Such diversity allows for pivoting or adjusting strategies in response to market fluctuations or unforeseen challenges. For example, having multiple funding sources can help entrepreneurs weather financial uncertainties, while a technologically versatile team can adapt to rapidly changing technological landscapes. Paradoxically, resource scarcity can stimulate entrepreneurial creativity and innovation. When faced with limitations, entrepreneurs often employ innovative resource allocation strategies to overcome challenges. Techniques like bootstrapping, where a business starts with minimal external capital, or forming collaborative partnerships to pool resources become essential in resource-constrained environments. These strategies force entrepreneurs to think outside the box and discover unconventional solutions to resource limitations. Resource constraints also encourage entrepreneurs to adopt sustainable practices. When resources are limited, there is an incentive to maximize efficiency and minimize waste. Entrepreneurs may seek environmentally friendly solutions, explore circular economy principles, or develop lean and efficient processes, which not only address resource constraints but also resonate with environmentally conscious consumers (McGahan, 2021).

5.4 Relationship between Institutional Support and Project Commercialisation

Institutional support, a critical component of various sectors, including education, entrepreneurship, healthcare, and social services, refers to the resources, guidance, mentorship, and infrastructure organizations, institutions, or entities provide to achieve specific objectives, goals, or initiatives. This support is typically extended by established and reputable institutions, such as universities, government agencies, non-profit organizations, and industry associations, to individuals, startups, or projects seeking to lever-

age external assistance and expertise (Jafari-Sadeghi et al., 2020).

Mentoring and guidance are critical aspects of institutional support. Institutions often offer access to experienced individuals who can serve as mentors or advisors, providing valuable insights, advice, and direction. Mentorship can be instrumental in helping individuals navigate complex challenges, make informed decisions, and refine their skills or strategies. Institutional support also encompasses financial resources, grants, scholarships, or funding opportunities made available to individuals or organizations pursuing specific objectives. Financial aid can catalyze innovation, research, entrepreneurship, or educational attainment, enabling individuals and entities to bring their ideas to fruition, undertake projects, or invest in growth and development (Burgess et al., 2018).

The relationship between institutional support and project commercialization has been a major topic of study in entrepreneurship. This literature review explores how this support helps and speeds up the process of turning new ideas into successful projects. Institutional support is known to be a powerful driver for project commercialization. It includes various types of help, such as resources, advice, and mentorship from universities, government agencies, incubators, accelerators, and industry groups. These institutions offer essential support to entrepreneurs and innovators, giving them the tools and knowledge needed to manage the complexities of commercialization effectively (Rodríguez-Insuasti et al., 2022).

Central to institutional support is mentorship and guidance, often offered by experienced entrepreneurs and industry experts. These mentors provide invaluable insights, drawing from their own experiences to offer advice on strategy formulation, risk management, and decision-making. Entrepreneurs who benefit from mentorship gain not only access to knowledge but also access to networks, opening doors to partnerships and collaborations. Institutional support frequently includes access to vital resources like state-of-the-art facilities, research labs, and technology infrastructure. This access reduces resource-re-

lated barriers entrepreneurs might otherwise face, allowing them to expedite product development and innovation. Institutions accelerate commercialization by providing entrepreneurs access to physical and technological resources (Hanson, 2021).

Financial support is another critical facet of institutional assistance. Through grants, scholarships, and research stipends, institutions provide entrepreneurs with the financial cushion to focus on product development and market research. This financial backing alleviates immediate financial pressures and instills confidence in entrepreneurs, empowering them to pursue their commercialization goals. Institutional affiliations often facilitate networking and the formation of strategic partnerships. Entrepreneurs embedded within institutional ecosystems gain access to an extensive network of potential collaborators, investors, and industry players. Collaborative partnerships forged through these connections can streamline market entry, provide access to additional resources, and enhance the commercialization experience (Baker & Judge, 2020).

Universities and research institutions are crucial for the success of technology-based ventures. They give entrepreneurs access to the latest research and development resources, which helps drive innovation and improve products. Collaborative research projects at these institutions can lead to major breakthroughs that boost the chances of successful commercialization. Business incubators and accelerators, often connected to these institutions, offer structured programs to support startups. These programs provide entrepreneurs with mentorship, office space, networking opportunities, and access to funding. Joining these programs can greatly speed up the commercialization process by offering a supportive environment for entrepreneurs to succeed. Overall, universities and research institutions are central to advancing technology-based ventures. They do more than just teach and conduct research—they are important centres of innovation that offer resources and support to help entrepreneurs turn their ideas into successful commercial projects (Mei & Symaco, 2021).

Universities and research institutions are often at the forefront of cutting-edge research and development in various fields. Entrepreneurs associated with these institutions can tap into this knowledge base, gaining access to state-of-the-art laboratories, specialized equipment, and expert researchers. This access enables entrepreneurs to develop and refine their technology-based products or services, leveraging the latest advancements in their respective industries. The synergy between academic research and entrepreneurial innovation is a powerful driver of technological progress (Shkabatur et al., 2022).

Collaborative research projects between entrepreneurs and academic institutions can yield breakthroughs that have the potential to transform industries. These partnerships allow entrepreneurs to combine their practical insights and market understanding with the academic institution's deep domain expertise. The outcome often includes novel solutions, innovative applications, or disruptive technologies that significantly improve the prospects of successful commercialization. These collaborations not only enhance product development but also open doors to funding opportunities and market validation. Many universities and research institutions operate or partner with business incubators and accelerators. These programs offer structured support to startups and early-stage ventures. Entrepreneurs participating in these programs gain access to invaluable resources such as mentorship from experienced business professionals, dedicated office spaces, networking opportunities with industry experts and investors, and access to various funding sources. Business incubators and accelerators provide an ecosystem that nurtures and guides startups through the complex process of commercialization. Participation in university-affiliated incubators and accelerators can substantially accelerate the commercialization journey. These programs provide a structured and supportive environment where entrepreneurs can focus on refining their business models, validating their market assumptions, and honing their strategies. The mentorship and guidance received during these programs can help entrepreneurs avoid common pitfalls

and make informed decisions, significantly improving their chances of success (Wright et al., 2022).

5.5 Relationship between Creativity and Innovation and Project Commercialisation

Creativity and innovation are closely related but different ideas that drive progress and problem-solving in many areas, including business, technology, the arts, and science. Creativity is the ability to come up with new and valuable ideas, solutions, or insights. It means thinking in new ways, connecting different ideas, and approaching challenges with an open and imaginative mind. Creativity is not just for the arts; it is also important in scientific research, engineering, entrepreneurship, and everyday problem-solving. Creative people are curious, original, and can see problems from different angles. They are motivated to explore new possibilities and question the usual ways of doing things (Tamm et al., 2022).

On the other hand, innovation transforms creative ideas into practical, tangible, and valuable outcomes. It encompasses developing, adopting, and implementing new products, services, processes, or business models that improve efficiency, address unmet needs, or create a competitive advantage. Innovation requires generating creative ideas and their refinement, testing, and adaptation to real-world contexts. It often involves collaboration, risk-taking, and a commitment to continuous improvement. Innovation can occur at various scales, from incremental improvements to disruptive breakthroughs that reshape entire industries (Park et al., 2021).

In practice, creativity and innovation are deeply interconnected. Creative thinking provides the raw material for creation, serving as the wellspring of new ideas and possibilities. Without imagination, invention would be limited to incremental changes and refinements, missing out on the transformative potential of fresh insights and approaches. Conversely, innovation channels creative energy into practical applications, ensuring that innovative ideas have real-world impact and relevance (Chang and Chen, 2020).

The intricate interplay between creativity, inno-

vation, and project commercialization is a central dimension of entrepreneurship and innovation. This literature review explores the nuanced relationship between creativity, innovation, and the successful commercialization of projects, elucidating the multifaceted ways these elements synergize to transform visionary ideas into thriving ventures. Invention refers to the generation of novel ideas, solutions, or concepts. On the other hand, innovation involves practically applying these creative ideas to bring about tangible and marketable outcomes. Together, they form the cornerstone of entrepreneurial endeavors. Creativity serves as the seed from which innovation sprouts. Entrepreneurs' creative thinking abilities allow them to identify unmet needs, recognize opportunities, and envision new product or service concepts. Creativity fuels the ideation phase of project development, enabling entrepreneurs to conceptualize innovative solutions to real-world problems (Concilio et al., 2019).

While creativity generates ideas, innovation catalyzes their transformation into marketable products or services. Innovation involves not only the development of new products or processes but also the strategic positioning of these innovations in the market. It encompasses product development, market analysis, and adopting novel business models. The relationship between creativity, innovation, and project commercialization is underscored by their combined potential to confer competitive advantage. Creative problem-solving and innovative solutions enable entrepreneurs to differentiate their projects from competitors by offering unique value propositions or disruptive innovations. This competitive edge is a critical factor in project commercialization success (Concilio et al., 2019).

Innovation, driven by creative insights, empowers entrepreneurs to adapt to changing market conditions and consumer preferences. Creative problem-solving enables entrepreneurs to address challenges and seize emerging opportunities swiftly. This adaptability is particularly valuable in the dynamic landscape of project commercialization. Effective project commercialization necessitates a deep understanding

of customer needs and preferences. Creativity and innovation play pivotal roles in customer-centric approaches. Entrepreneurs who harness ingenuity to identify latent customer demands and innovate to fulfil them are more likely to achieve market success (Davies et al., 2018).

Creative thinking often encourages a willingness to take calculated risks. Entrepreneurs who embrace creativity are more inclined to experiment, adapt, and iterate their projects based on feedback and market dynamics. This iterative approach enhances the likelihood of successful commercialization by reducing the risk of product-market misalignment. The entrepreneurial mindset underpins the relationship between creativity, innovation, and project commercialization. Entrepreneurs who embody this mindset seek creative and innovative solutions to their challenges. They view constraints as opportunities for inventive problem-solving, driving project development and commercialization forward (Paulsen et al., 2021).

Contextual factors influence the relationship between creativity, innovation, and project commercialization. Industry dynamics, market maturity, regulatory environments, and cultural norms can shape how creativity and innovation impact commercialization outcomes. Entrepreneurs must tailor their creative and innovative approaches to align with the specific context of their projects. Contextual factors indeed wield significant influence over the interplay between creativity, innovation, and project commercialization. Various external elements, such as industry dynamics, market maturity, regulatory environments, and cultural norms, have the potential to shape how these components interact and ultimately impact commercialization outcomes. Entrepreneurs must remain cognizant of these contextual factors and tailor their creative and innovative approaches to align with the specific demands and constraints imposed by their project's environment. The industry in which a project operates greatly affects the role of creativity and innovation in commercialization. In highly competitive and rapidly evolving sectors, such as technology or biotechnology, innovation

is often the key driver of success. Creative problem-solving and disruptive ideas are essential to gain a competitive edge. In contrast, in more mature and established industries, incremental innovations and cost-effective solutions may be more relevant. Entrepreneurs need to gauge the level of creative disruption that is suitable for their industry and adapt their strategies accordingly (Concilio et al., 2019).

The maturity of the target market plays a pivotal role in shaping the commercialization process. In emerging markets, where customer needs are still evolving, creative and innovative solutions can have a substantial impact. However, in mature markets, customers may have well-defined preferences and expectations. Entrepreneurs must balance creativity and innovation with meeting these established demands. Understanding the nuances of customer expectations and market maturity is essential to tailor product development and marketing strategies effectively. Regulatory frameworks vary significantly across industries and regions. Entrepreneurs must navigate these regulatory environments while maintaining creative and innovative efforts. Compliance with industry standards and regulations is non-negotiable in many sectors, such as healthcare or finance. Creative solutions that facilitate compliance, rather than circumvent it, are often required. Entrepreneurs need to work within the boundaries of the law and align their innovations with regulatory requirements, which can be a complex and resource-intensive process. Cultural norms and societal values influence market acceptance and adoption. Creative and innovative products or services must align with these norms to gain traction. Entrepreneurs should be sensitive to cultural nuances, preferences, and potential resistance to novel concepts. Adapting and tailoring innovations to align with local culture and values can significantly impact market success. Cross-cultural understanding and customization may be necessary to ensure that creativity and innovation resonate with the target audience (Gulamov et al., 2022).

6. Conclusion

This comprehensive review discusses the theo-

retical foundation for understanding the dynamics of project commercialisation, with a focus on critical factors and their interrelationships. The review explores various dimensions, theories, and empirical studies related to entrepreneurship, innovation, and the role of moderating variables, offering insights into the complex web of factors that influence the commercialisation of projects. It highlights the multifaceted nature of project commercialisation, encompassing aspects such as entrepreneurship skills, networking abilities, access to resources, institutional support, as well as creativity and innovation.

Author Contributions

Conflict of Interest

The authors declare no conflict of interest.

Data Availability Statement

Data sharing not applicable as this is a review article.

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