

Integrating Real-World Dynamics: The Synthesis of Case-Based and Experiential Learning Methodologies in Entrepreneurship Education at Tecnológico de Monterrey

Abstract

This article examines the application and assessment of a case-based methodology integral to the Entrepreneurship Academic Program (Bachelor in Entrepreneurship) at Tecnológico de Monterrey. It outlines a methodological framework that emphasizes the practical application of knowledge and competency development, illustrated through various examples and actionable steps. The methodology's unique blend of raw case studies, problem situations, and live cases, developed in partnership with strategic allies in business and academia, demonstrates the evolution of case-based education at the confluence of challenge-based and experiential learning. This paper provides a detailed overview of how such a structure can inform and enhance program and course design, and discusses the significant impact for students and instructors engendered by this pedagogical approach.

Key Words: Case-based education, Experiential learning, Education Innovation, Entrepreneurship Education

Introduction

Entrepreneurship education (EE) has increasingly become a cornerstone of progressive educational models that seek to equip students with the necessary skills to navigate and innovate within complex economic landscapes. At the forefront of this educational revolution is the integration of challenge-based and experiential learning strategies, which are intrinsic to our educational framework. These methodologies do not merely supplement the learning experience; they form the bedrock upon which the Bachelor in Entrepreneurship at Tecnológico de Monterrey is constructed. This program is tailored to foster a deep understanding of entrepreneurial principles through real-world application, leveraging both challenge-based and experiential learning to bridge the gap between theoretical knowledge and practical skills.

Anchoring the program's pedagogical approach is the case-based method, a dynamic educational tool that transcends traditional teaching paradigms. Rooted in the belief that learning is most impactful when contextualized in real-world scenarios, the case-based method has been meticulously woven into the fabric of the Bachelor in Entrepreneurship's curriculum. This method's effectiveness is amplified when applied through raw cases and problem situations, which present students with unfiltered, complex data sets that mimic the ambiguities and uncertainties inherent in actual business challenges. By grappling with these raw scenarios, students develop a keen ability to dissect, analyze, and strategize, mirroring the decision-making processes of seasoned entrepreneurs.

The incorporation of experiential cases is another distinctive feature of the program. These cases are not hypothetical constructs but are drawn from the actual challenges faced by our strategic partners in the business world. By working closely with these partners, students gain unique

insights into the entrepreneurial process, from ideation to execution. This collaboration with industry leaders ensures that the educational experience is continually aligned with the evolving demands of the marketplace, providing students with a relevant and adaptive skill set.

Tecnológico de Monterrey's Bachelor in Entrepreneurship is thus a testament to the transformative power of integrating case-based, challenge-based, and experiential learning. It is a model designed not just to impart knowledge, but to instill a mindset of innovation and a capability for problem-solving that is expected of tomorrow's entrepreneurial leaders. As we unfold the layers of this educational design, it becomes evident how each component – from raw cases to strategic partnerships – is integral to the development and successful implementation of our model. This approach has landed various important recognitions for the school, among others the high ranking within the Princeton Top 50 Undergrad Entrepreneurship Programs at 6th place for 2023, and the QS Reimagine Education award in the category of Innovation in Business Education with a bronze medal from 2022 and a gold medal from the 2023 edition of the competition.

Literature Review

At the heart of Tec de Monterrey's educational paradigm lies the student-centered approach, encapsulating the learning journey as a core element. This approach aims to empower students with the ability to assimilate their understanding of the world and apply their competencies to address modern-day societal issues. Competencies, as characterized by Lombardo (1996), are the measurable traits of an individual that correlate with their professional success, encompassing behaviors, technical abilities, attributes, or attitudes.

The TEC21 Educational Model categorizes competencies into two branches: disciplinary and transversal. Disciplinary competencies encompass the essential knowledge, skills, attitudes, and values vital for professional practice, which students develop progressively, from foundational to advanced levels within their field of study. Transversal competencies, however, are cultivated throughout the educational experience across any discipline, enhancing the professional life of graduates and influencing the caliber of their professional practice (Modelo Educativo Tec21, 2018).

Underpinning Tec21's educational orientation are two foundational learning principles: constructivist and experiential. Rooted in Vygotsky's (1962) philosophy, the constructivist principle posits that knowledge is not passively received but actively constructed by learners. Complementing this, the experiential learning principle, as envisioned by Dewey (1938), emphasizes learning through personal experience and the subsequent reflection. It fosters a transformation in students' cognitive frameworks and a reorientation of their attitudes, values, perceptions, and behaviors (Bandura, 1986, 1997). Students gain pertinent knowledge through active engagement and assume responsibility for their learning journey (Dickinson, 1995).

A multitude of pedagogical strategies can be employed to nurture these competencies in a constructivist and experiential context. Among them is collaborative learning, which is a communal experience aimed at fostering solidarity among students and positioning education as a collective endeavor. This approach is grounded in the belief that knowledge is socially constructed and emphasizes four key principles: student-centered instruction, the primacy of interaction and practical application, group work as a pivotal learning mode, and the integration of structured problem-solving into the educational process.

Case-based education, pioneered by Harvard in 1914, is another powerful method that utilizes intricate, real-world scenarios as a platform for discussion. It encourages learners to analyze, deconstruct, and discuss problematic situations, promoting the articulation of personal viewpoints and fostering peer-to-peer discourse in the classroom. This method offers students a dynamic and enduring learning experience, as opposed to the ephemeral retention of disconnected facts characteristic of traditional education models (Brunner, 1997). Brunner critiques the often abstract and detached theory presented in textbooks, advocating for an education that resonates with students' lived experiences, thereby enhancing their motivation to learn. The case study method not only spurs students' cognitive and emotional engagement (Nkhoma, 2014) but also amplifies learning, participation, and fulfillment. Echoing Dewey (1938), it supports the educator's dual mission to facilitate student development, inspire an enduring zeal for growth, and enable students to contribute positively to the betterment of others.

The study conducted by Colombelli et al. (2022) explores the impact of Challenge-Based Learning (CBL) on students' entrepreneurial mindset, skills, and intentions. The research is grounded in the increasing emphasis on entrepreneurship education (EE) as a critical component for economic and personal development, aligning with the European Commission's advocacy for entrepreneurial competencies as key for job market integration and venture creation (Bacigalupo et al., 2016). The authors posit that while experiential methodologies such as CBL are gaining traction, there is limited empirical evidence assessing their effectiveness, particularly in the context of entrepreneurship education (Martinez & Crusat, 2020; Palma-Mendoza et al., 2019).

Colombelli et al. (2022) analyze data from 127 students who participated in the Challenge@Polito program, designed to foster entrepreneurial skills through real-world problem-solving. The program's structure reflects the three-stage framework of Engage, Investigate, and Act (Apple Inc.,

2012; Nascimento et al., 2019), aiming to cultivate a robust entrepreneurial culture among students. The authors measured changes in students' entrepreneurial mindset, skills (such as creativity, planning, and financial literacy), and intention to start a business before and after the program using validated scales (Moberg et al., 2014). The results of the study indicated a positive and significant impact of CBL on the entrepreneurial mindset and skills, with notable improvements in creativity, planning, and financial literacy. However, while entrepreneurial intention also increased, this change was not statistically significant (Colombelli et al., 2022). This research provides us with a framework whithing which we can by providing quantitative evidence of the benefits of CBL in entrepreneurship education and suggests that such programs can effectively enhance entrepreneurial traits, which are essential for the economic development and innovation ecosystem (Sánchez, 2011; Cui et al., 2021).

Methodology description

The methodology of the integration of case-based learning, experiential education and challenge-based learning within the design and implementation of the Bachelor in Entrepreneurship can be perceived from three perspectives. Firstly, the integration of a portfolio of instruments of case based learning in the design of all the classes student take during their studies, secondly through the through the use of interaction with our formation partners (startups, companies and institutions that closely collaborate with our instructors) based on experiential learning and live cases, and thirdly through the implementation of a multi-semester project that the students have to work with and apply all their learnings to, the development of which is based on stages with specific advances, where the own experience of the student turns into a case based learning experience.

The methodology underpinning the Bachelor in Entrepreneurship at Tecnológico de Monterrey is distinguished by its tripartite structure, which strategically integrates case-based learning, experiential education, and challenge-based learning. This multifaceted approach is deliberately segmented into three distinct approaches, each contributing uniquely to the development of students' competencies and practical understanding of entrepreneurship. Firstly, the integration of a portfolio of instruments of case based learning in the design of all the classes student take during their studies, secondly through the use of interaction with our formation partners (startups, companies and institutions that closely collaborate with our instructors) based on experiential learning and live cases, and thirdly through the implementation of a multi-semester project that the students have to work with and apply all their learnings. The following outlines the essence and application of each phase within the program's curriculum.

Part One: Case-Based Learning Integration

The first phase of our methodology involves the infusion of case-based learning across the curriculum. In the classroom, adherence to the Tec21 educational model, launched in 2019, mandates the incorporation of raw cases or problem situations into each course (Modelo Educativo Tec21, 2018). Each course incorporates a carefully selected assortment of raw cases or problem situations, serving as microcosms of the broader entrepreneurial landscape. These cases are designed to draw direct parallels to the concepts and theories explored in class, challenging students to apply their learning to tangible, real-life business dilemmas. The Centro Internacional de Casos plays a crucial role here, collaborating with a diverse group of academics and industry experts to regularly update and refine these cases, ensuring they remain reflective of contemporary challenges and innovations.

Part Two: Experiential Learning with Formation Partners

The second aspect is characterized by experiential learning, facilitated through our formation partners—startups, companies, and institutions that are deeply interwoven with the program. This partnership extends the classroom's theoretical learning into the practical realm, with students engaging directly with live cases and real business issues and situations presented by these collaborators. Our instructors and challenge coordinators meet with the companies to define the specific challenge, gather information and develop a clear outline of the problem to be solved. The "Blocks" instructional approach is instrumental in this phase, as it involves extended class periods dedicated to addressing real-world challenges identified by our partners, besides the traditional content modules. This immersive interaction not only allows students to apply their knowledge to solve authentic business issues but also provides a platform for critical feedback and potential real-world implementation of their solutions.

Part Three: The Multi-Semester Capstone Project

The final aspect of the methodology revolves around a multi-semester capstone project that each student develops, embodying a comprehensive case study that evolves over time. This project is not static; it dynamically progresses through various stages of the entrepreneurial process, including opportunity identification, ideation, validation, prototype development, launch, and scaling. Each stage corresponds to a semester within the program, ensuring a logical and structured development trajectory. As students advance their projects, they concurrently assume the role of consultants for their peers, creating a collaborative, mentorship-driven environment. This not only

enriches their own project with diverse perspectives but also enhances their problem-solving and consulting skills.

The pedagogical architecture of Tecnológico de Monterrey's Bachelor in Entrepreneurship represents an integration of case-based and experiential learning methodologies, orchestrated to provide a progressive educational journey. The first part lays the foundation through case-based learning, where students dissect and navigate complex business scenarios, honing analytical and decision-making skills. Progressing to the second, experiential learning is exemplified as students step beyond theoretical constructs to engage with real-world challenges set forth by our formation partners. This immersive experience is deepened in the third part, where the students' capstone projects evolve through experiential cycles that reflect the iterative nature of entrepreneurial ventures. Collectively, these interconnected components form a comprehensive framework, leveraging the case-based method as a touchstone for learning and experiential encounters as catalysts for growth, ensuring that students not only learn about entrepreneurship but live through its process.

Implementation of the method in practice

The methodology, implemented across seven campuses since 2019, is continuously refined. This section will present concrete examples of the method applied to classes, blocks, and semester-long projects, showcasing the execution and offering best practices for future adaptations.

Application of the first aspect – development of a problem situation to enhance student learning.

In the transformative 5th semester of the Bachelor in Entrepreneurship, students are immersed in the intricacies of prototyping and innovation, wielding emerging technologies as both a medium and catalyst for startup development. Within this critical phase, the course “Methodologies of Technological Innovation” emerges as a pivotal arena for understanding innovation's practical methods and tools. Tasked with the creation of a relevant Problem Situation case study, Professor Miguel Rodriguez from the Monterrey Campus sought to transcend the traditional classroom exercise. In a collaborative effort with the European Commission, the case was ingeniously linked to a pressing challenge slated for the DigiEduHack global hackathon in November 2023, centering on the application of emerging technologies to spearhead educational innovation.

In anticipation of this event, a strategic decision was made in the spring of 2023 to invite all program students to participate in the hackathon, setting the stage for them to refine their skills in a competitive, global context. To ensure they were well-prepared, the problem situation developed for class in September and October was directly tied to this real-world challenge, providing students a platform to apply and test their solutions prior to the hackathon. This proactive engagement in problem-solving served as an invaluable precursor to the 24-hour DigiEduHack in November, for which the class, spanning across seven campuses, saw over 150 students register to participate at the main campuses in Guadalajara, Monterrey, Mexico City, and Queretaro. The initiative culminated in four exceptional teams advancing to a national finale hosted at the INCmty entrepreneurship festival in Monterrey, showcasing the seamless integration of classroom learning with real-world problem-solving—a testament to the methodological synergy that propels students beyond academic theory into the realm of practical, impactful innovation.

Application of the second aspect – work with formation partners

During the semester spanning August to December 2023, the innovative Block titled – Design of High Impact Solutions – was conducted across all campuses. This Block, pivotal in promoting social entrepreneurship, not only emphasizes social impact but also serves to validate social work hours for our students. The challenge, in collaboration with the social impact business Grupo Murlota, tasked students with enhancing circular economy initiatives and sustainability efforts among local chicken farmers. This aimed to guide farmers toward a micro-entrepreneurial model and towards the professionalization of their operations. Given Grupo Murlota's expansive presence nationwide, students were granted the opportunity to delve into the company's operations both theoretically and practically.

This period was transformative, as it allowed for the creation of an experiential living case. Students actively engaged in gathering primary data directly from the visits to the sites and through interactive video calls with company representatives, including the founder. Additionally, they were tasked with researching secondary data from an array of resources provided. This comprehensive analysis led to a rich, immersive educational experience for over a hundred students from seven campuses. They were not only able to pinpoint opportunities for social impact within the company's extensive value chain but also to design and articulate high-value sustainable solutions. Impressively, many of these student-generated proposals were appraised and integrated into Grupo Murlota's strategic portfolio, symbolizing the tangible results of marrying academic learning with real-world application and embodying the essence of experiential case-based education with formation partners.

Application of the third aspect – immersion in the capstone project

Throughout their academic tenure, our students are immersed in a journey of entrepreneurial discovery, crafting individual projects that serve as fertile grounds for competency development. These projects, rooted in real business contexts, are meticulously designed to stimulate high levels of learning while mitigating risk, thereby invoking a deep personal and emotional investment from our students. It is within the 6th semester that this component of our pedagogical approach reaches its zenith, with the challenge-based framework laser-focused on nurturing each student's entrepreneurial venture.

The program further empowers students with the choice of an entrepreneurship residency semester, a period dedicated to the acceleration and refinement of their business initiatives. Among the myriad success stories this model has fostered, the narrative of Roxana Martinez stands out. As the founder of Kaia, a sustainable clothing line partnering with marginalized women, Roxana embodies the entrepreneurial spirit cultivated at Tecnológico de Monterrey. Her journey began at the Santa Fe campus, where the initial seeds of Kaia were sown and nurtured through the Bachelor program's early semesters. Benefiting from targeted mentoring and a supportive learning environment, she was able to weave the theoretical concepts learned into the fabric of her burgeoning enterprise. Later, Roxana's transfer to the Queretaro campus marked a pivotal chapter in her education, coinciding with her participation in the entrepreneurship residency program, which significantly bolstered Kaia's growth trajectory.

Roxana's venture not only garnered accolades, such as being a top finalist in the Hult Prize competition and receiving the Global Entrepreneurship Student Award for Mexico, but it also created palpable social and environmental impacts. Perhaps most importantly, Roxana's ongoing entrepreneurial odyssey includes imparting her accumulated wisdom back to the student community, enhancing the collective learning experience. By facilitating an experimental canvas

for students like Roxana and steering them through a gauntlet of tailored challenges, our educational approach interlaces experiential and case-based methods with challenge-based learning. This synergistic blend is instrumental in sculpting the competencies of hundreds of emerging entrepreneurs.

Results of the implementation

Examining the results from various perspectives within our academic ecosystem, we believe that the impact of our methodology is overwhelmingly positive. We explore the multifaceted impacts of integrating case-based and challenge-based learning methodologies from the viewpoints of students, instructors, and formation partners. Each perspective offers insights into the effectiveness of the program in cultivating competencies, enhancing teaching methods, and fostering industry innovation. We will present a comprehensive picture of the successes and learning opportunities that have emerged, painting a vivid portrayal of the transformative educational experience at Tecnológico de Monterrey.

From the Student's Perspective:

The implementation of our integrated methodology has had a profound impact on student outcomes, particularly in the development of competencies essential for entrepreneurial success. We employ a competency-based evaluation system that rigorously assesses student performance through tangible evidence and practical assessments throughout their academic journey. The results, gathered during the courses and at the culmination of their studies, have been overwhelmingly positive. Students have demonstrated substantial growth in areas such as critical thinking, problem-solving, and innovation, equipping them with the skills necessary to navigate

and excel in a complex business environment. The evidence of their competencies is not only academic in nature but also evident in the real-world success of their entrepreneurial ventures and projects.

From the Instructors' Perspective:

Instructors play a pivotal role in the value chain of our educational model, consistently enhancing the program through iterative feedback and the refinement of pedagogical strategies. Their commitment to the systematic implementation of our three-part method across all campuses has been instrumental in maintaining the program's high standards. Faculty members contribute to the evolution of the curriculum by sharing insights that stem from both positive outcomes and challenging experiences. This feedback loop ensures that the program remains dynamic and responsive to the needs of both the students and the rapidly changing business landscape. At the same time professors continually work on the development of the raw cases, problem situations and the collaboration with formation partners through the framing of the experiential challenges which adds to the value of the methodology.

From the Formation Partners' Perspective:

Our formation partners, integral to the practical component of our educational approach, reap significant benefits from their collaboration with academia and students. Engaging with innovative solutions developed by students allows them to stay at the forefront of industry trends and challenges. In return, they contribute to the community by helping to shape a new generation of students who are adept at tackling real-world issues. This symbiotic relationship is bolstered by the fusion of challenge-based and case-based education, which ensures that students can transfer classroom learning into actionable insights and strategies in professional settings. The partners not

only gain fresh perspectives and ideas but also play a critical role in nurturing a workforce ready to lead and innovate in a global economy.

Conclusions

In synthesizing the pedagogical initiatives undertaken by Tecnológico de Monterrey, it becomes evident that the intersection of case-based and challenge-based learning methodologies within the Bachelor in Entrepreneurship program is more than an educational experiment; it is a proven model for fostering innovation and entrepreneurial acumen. This article has traversed the journey from the theoretical underpinnings of the program's design to the practical implications and outcomes for students, instructors, and formation partners.

The program's competency-based evaluation framework, grounded in evidence-based assessments, has substantiated the acquisition of key entrepreneurial competencies among students. The results, reflected in both academic performance and real-world entrepreneurial engagements, attest to the effectiveness of the program's integrative approach. Students emerge as adept problem-solvers and innovators, ready to contribute meaningfully to society and the economy.

Instructors, serving as both educators and facilitators, have provided invaluable feedback that has been instrumental in the continuous refinement of the program. Their insights ensure that the program remains adaptive and responsive to the evolving demands of entrepreneurial education. The collaborative efforts of the faculty across campuses underscore a commitment to a shared vision of excellence and relevance in entrepreneurial education.

The engagement with formation partners has illustrated a reciprocal enrichment of academia and industry through case-based experiential education. These partnerships have not only provided

practical platforms for students to apply their learning but have also introduced fresh, innovative solutions to contemporary business challenges. The contribution of these partners extends beyond immediate business benefits, as they play a crucial role in preparing a workforce that is equipped to address and surmount real-world challenges.

In conclusion, the program at Tecnológico de Monterrey stands as a testament to the transformative potential of integrating experiential learning with traditional academic frameworks. The success of this approach is manifest in the preparedness of our students to enter the entrepreneurial landscape as leaders and changemakers, suggesting a scalable model for business education that other institutions might emulate.

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