Framework for Entrepreneurial Education: Integrating Experiential and Transformative Learning in Vocational Institutions

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Abstract
Entrepreneurial education is essential for promoting an entrepreneurial culture, stimulating socio-economic development, and fostering innovation in all countries. In the academic literature, experiential learning, which integrates experience into educational processes, is considered an effective approach to developing entrepreneurial skills. Transformative learning, on the other hand, focuses on changing students' thinking structures and beliefs by providing new reference systems. This is essential to stimulate new perspectives on entrepreneurship and to prepare future professionals for a highly volatile scenario. Despite the amount of research on entrepreneurial education, its application in vocational education is still under-researched and many studies are not based on consolidated learning theories. In view of this, the main objective of this research is to develop a support structure for entrepreneurial education in the context of Brazilian public vocational and technological education. The research adopted the Educational Design Research method, characterized by a theoretical and contextual orientation, focused on problem solving. The data collection techniques promoted co-creation among the participants. As a result, the research proposes a four-dimensional structure that integrates a shared vision of entrepreneurship, integrated educational practices, internal and external relationships, and related support processes.

Keywords: Entrepreneurial Education, Experiential Learning, Transformative Learning

Introduction

Entrepreneurship is widely recognized as a driver of socio-economic development and a catalyst for innovation. This scenario leads to a growing appreciation of entrepreneurship in the field of education. Entrepreneurial education (EE) has become a strategy to strengthen educational reforms (Wang et al., 2022) and plays a key role in developing the entrepreneurial skills of future professionals and leaders (Nayak et al., 2024). It also contributes to reducing unemployment (Shwedeh et al., 2023), increasing employability, professional development, and strengthening citizenship (Rodrigues, 2023).

Defined as a set of programs, courses, and processes aimed at developing entrepreneurial knowledge, skills and attitudes (Hahn et al., 2017), entrepreneurial education currently covers areas beyond business education, including vocational and technical education. This context includes the Brazilian Federal Institutes of Education, Science, and Technology, also known as Federal Institutes of Education (IFs), a federal public network present in all Brazilian states with technical and higher education courses, whose objectives include promoting entrepreneurship, innovation, and income generation.

The scientific literature points out that learning in entrepreneurship is more effective when it is related to real situations, promoting the student's protagonist action and critical reflection in the generation of knowledge (Nabi et al., 2017; Pittaway & Cope, 2007; Warhuus et al., 2018). In this context, experiential learning (EL) (Kolb, 1984, 2015), which focuses on the transformation of knowledge through experience, gains importance through the integration of this experience in entrepreneurial education processes (Shwedeh et al., 2023; Bell & Bell, 2020; Chhabra et al., 2021; Rodrigues, 2023; Preedy et al., 2020).

However, despite the advances in research, entrepreneurial education is still a disciplinary field in consolidation, especially in terms of pedagogy and the integrated incorporation of entrepreneurship into curricula (Rodrigues, 2023). In a connected and knowledge-intensive world, entrepreneurship curricula are slowly updated, making it difficult to train students to deal with uncertainty, ambiguity, and volatility (Kononiuk et al., 2021). In addition, future (and current) entrepreneurs need to be able to think critically and envision ways of doing business that are consistent with sustainable development.

Entrepreneurial education should foster multiple perspectives on entrepreneurship, challenge entrenched ideas and stereotypes, and promote new views on the act of entrepreneurship (Higgins et al., 2019; Kakouris, 2015). In this sense, transformative learning (TL) (Mezirow, 1981) emphasizes problematization in education and encourages critical reflection on reality and possibilities for action. In TL, structures of meaning are transformed through reflection, questioning assumptions, and assessing whether existing belief systems are still valid and functional (Mezirow, 1981).

Constructivist EE methods based on EL and TL require specific pedagogical processes (Bell & Bell, 2020), educator training (Motta & Galina, 2023), leadership support, availability of institutional resources, and appropriate learning environments (Christensen et al., 2023). Moreover, beyond the didactic-pedagogical level, EE needs to consider ontological and philosophical questions about entrepreneurship, the role of its actors, and education in this context (Fayolle, 2013). This gap is reflected in the absence of models or frameworks that promote an integrated approach, including educational practices and support processes.

Therefore, this research proposes to investigate the following problem: how to develop a support structure for entrepreneurial education in the context of Brazilian public vocational and technical education – especially in the aforementioned IFs – based on the theories of experiential and transformative learning. The objective of this research is to present the first two steps taken to build this framework.

Entrepreneurial Education and Learning Theories

The scenario in which EE takes place calls for new educational paradigms aimed at active, self-directed and self-regulated educational processes by students (Preedy et al., 2020). Despite the growing volume of publications, EE is still considered to lack a theoretical foundation, especially when it comes to deepening the educational theories applied to the field (Fayolle, 2013; Kumar et al., 2020). In the literature review of this research, two learning theories were identified that can be used as a reference for structuring an EE framework: Experiential Learning (EL) and Mezirow's (1981) Transformative Learning (TL).

Experiential Learning is defined as a process by which knowledge is created through the transformation of experience (Kolb, 1984, p. 41), i.e., a process of meaning-making that involves significant experiences that serve as a source of learning at various levels (Wilson & Beard, 2013). David Allen Kolb, one of the main formulators of experiential learning theory (ELT), structured the Experiential Learning Cycle (ELC) into four adaptive processes: (i) **concrete experience** (CE), an experienced activity, situation, or event that serves as a basis for reflection; (ii) **reflective observation** (RO), conscious reflection on the experience with the goal of understanding what happened, its implications, and meanings; (iii) **abstract conceptualization** (AC), construction of concepts and theories, integrating the acquired knowledge with existing knowledge to develop a new understanding; and (iv) active experimentation (AE), application of the new knowledge in practice, testing its consequences, and guiding new experiences.

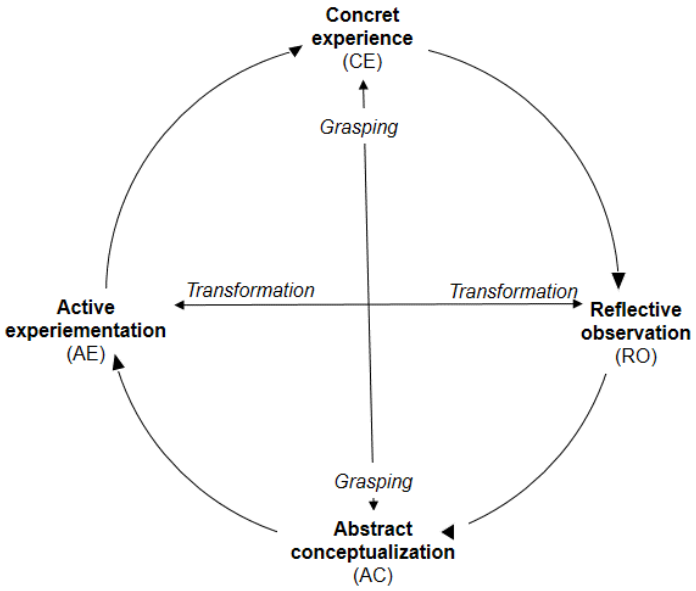

Figure 1: Kolb's Experiential Learning Cycle
Source: Kolb (2015)

The second theory that guides this research is Mezirow's Transformative Learning (1981, p. 190), which he defines as a process of using a previous interpretation to construct a new or revised interpretation of the meaning of the experience in order to guide future action. This theory emphasizes the importance of problematization in education, promoting reflection and critical thinking to make individuals aware of their reality and their options for action. In TL, structures of meaning are transformed through reflection, which involves critiquing the assumptions that determine whether the existing belief system remains valid and functional (Mezirow, 1981). The TL approach is characterized not by the amount of information assimilated, but by the profound transformations it provokes in students (Arpiainen & Kurczewska, 2017; Bell & Bell, 2020; Kakouris, 2015).

In summary, although the two theories have different conceptions, they both emphasize experience and reflection in the learning process. EL focuses on practical application and individual learning styles, and TL emphasizes the critical transformation of learners' views and beliefs. Learning by doing and critical learning are fundamental to educating future leaders and entrepreneurs.

Method

This research adopts the Educational Design Research (EDR) method, which is developed in three macro stages (McKenney & Reeves, 2018):

i) Analysis and exploration: a scientific basis is sought to understand the problem and analyze the phenomenon in question; empirically, this includes the identification and diagnosis of the problem, which allows the development of preliminary requirements and long-term objectives. For this research, an integrative review of the literature on EL interrelated with EE was carried out, consolidating the analysis of 74 peer-reviewed articles. This stage was fundamental in providing the theoretical requirements for the framework. The **second data collection technique**, **documentary analysis**, considered Brazilian laws and resolutions related to Brazilian vocational education and was important in identifying existing assumptions. Also at this stage, 21 **interviews were conducted with educators** from nine IFs campuses in the state of Santa Catarina (Brazil). These interactions were important to get an overview of teaching practices, existing challenges, and possible requirements for the framework.

ii) Design and construction: based on the available knowledge and its interrelations, solutions are mapped out, articulating their theoretical and practical foundations; this allows the structure to be shared and critiqued.

iii) Evaluation and reflection: dedicated to the formulation of conclusions, restructuring or adaptation of the intervention proposal; reflection also aims at a broader theoretical understanding of the issue under study.

This article focuses on the results of the first two macro steps, as the last step is still in progress. The analysis of data from documents and interviews followed the guidelines of Braun and Clarke (2019): a) familiarization with the data, b) coding, c) identification of themes, d) review of potential themes, e) definition and naming of themes, and f) preparation of the final report. For the framework, analysis matrices were created to triangulate the data by comparing the literature, documentary analysis, and interview findings. This allowed the elements of the framework to be structured and presented in the results.

Results and Discussion

Before presenting the results of this research, it is important to briefly explain the organization studied.

The IFs are Brazilian public, multi-campus and multidisciplinary institutions that work in educational modalities that integrate science and technology, with the aim of training professionals for the world of work. These institutions are part of the Federal Network for Professional, Scientific and Technological Education (Federal Brazilian Law No. 11.892) and offer technical courses (secondary level), undergraduate courses (technologist, bachelor's, and teaching degrees) and graduate courses. In international terms, the educational offer of the IFs corresponds to the Technical and Vocational Education and Training (TVET) segment. Entrepreneurship is explicitly mentioned as one of the institutional purposes of the IFs (Federal Brazilian Law No. 11.892), with the support of educational processes that promote the generation of work, income, and citizen emancipation, contributing to local and regional socio-economic development.

According to Stadler (2017), the IFs face political, institutional, and methodological challenges in implementing EE. The author argues that an integrated approach to the institutional context is needed, taking into account the objectives of vocational and technical education and the need to strengthen the capacity of these institutions to engage in entrepreneurship and local development.

The results of the first two stages of the EDR are presented below, with the final presentation of the framework created, which was designed for technical courses for students at secondary school level and for undergraduate degrees (technologist, and bachelor's degrees).

Analysis and Exploration

In order to develop a framework to support the structuring of EE, in this first stage, the theoretical basis was defined and a situational diagnosis was made to understand the reality of practices, requirements and outcomes sought with the framework.

In relation to the **theoretical basis**, the empirical articles analysed identified that experience in EE is a source of learning that actively involves the student, is contextualized (Higgins & Galloway, 2014; Pittaway & Cope, 2007; Preedy et al., 2020), generates critical reflections (Bell & Bell, 2020; Kakouris, 2015; Preedy et al., 2020), and can take place in formal, informal and non-formal environments (Shwedeh et al., 2023). The experiential activities (Table 1) designed by the teachers include a diversity of practices aimed not only at creating new businesses, but also at developing solutions or projects for existing organizations.

These activities integrate curricular and extrcurricular opportunities. Elective activities are considered fundamental because they encourage students to find their own paths, promote interdisciplinarity (Nayak et al., 2024), collaboration among students, and interaction with the entrepreneurial ecosystem (Alam et al., 2023; Solan & Shtub, 2023). Among the methods, active approaches predominate (Bell & Bell, 2020), especially project-based learning and problem-based learning (Morselli & Orzes, 2023).

An important point in this analysis was the interaction with the external context. The relationship between the educational institution and the productive sectors is essential for the

teaching-learning process, innovation, and meeting the needs of society. In the studies analyzed, this interaction occurs through the participation of local entrepreneurs, external professionals or members of the community in educational activities and in the development of research and extension projects with the productive sectors and communities. In experiential activities, it was found that external actors play different roles in the provision of EE, acting as mentors (Chhabra et al., 2021), lecturers, judges in competitions, coaches (Preedy et al., 2020), and supporters of activities (Pittaway & Cope, 2007; Ramsgaard & Christensen, 2018). Many of these activities take place outside of the educational environment, in the organizations' or communities' own spaces.

In addition to these specific needs, which are summarized in Table 1, the theoretical review also identified possible existing models and frameworks, two of which were used as inspiration. The first is the model of Fayolle (2013), which considers two levels: i) the philosophical, with an understanding of the meaning of entrepreneurship and the role of education and the participants, which is fundamental to guide the practice; and ii) the didactic-pedagogical, which specifies the audience, content, methods, and evaluation. The second model was the UNESCO document *Entrepreneurial Learning for TVET Institutions: A Practical Guide* (Lindner, 2020).

Table 1 summarizes the main results of the theoretical analysis.

Table 1: EL and TL References for the Framework

Experiential Activities

Activities designed by educators to promote the teaching and learning of entrepreneurship. The literature review identified the following categories:

1) Integrated professional learning (Padilla-Angulo et al., 2021);
2) Competitions and business games (Pittaway & Cope,2017);
3) Creating real businesses (Bell & Bell, 2018);
4) Planning business plans and models (Williams, 2015);
5) Developing projects and activities (Ramsgaard & Christensen, 2018);
6) Simulating business plans and models (Padilla-Angulo et al., 2021);
7) Other (activities that do not fit into the previous categories but have an experiential basis) (Preedy et al., 2020).

Factors for implementing EL in EE

- Constructive alignment between content, student profile, and methods (Bell & Liu, 2019);
- Preparation of teachers and students for a constructivist approach; (Bell & Bell, 2020; Bell & Liu, 2019);
- Offering elective curricular (Van Der Lingen et al., 2020) and extracurricular activities (Padilla-Ângulo et al., 2021; Preedy et al., 2020);
- Application of active methods (Rodrigues, 2023), such as challenge-based learning, peer learning, and project-based learning;
- Integration of practice with theoretical knowledge and objectives (Bell & Bell, 2020; Chhabra et al., 2021);
- Stimulation of critical reflection by students (Bell & Bell, 2020);

- Assessment of learning with the integration of reflective activities (Warhuus et al., 2018);
- Integration with the external context for practicing activities and innovation (Alam et al., 2023), with the possibility of external actors participating in educational practices (Chhabra et al., 2021; Preedy et al., 2020);
- Personal development of educators for EE (Rodrigues, 2023).

Challenges

- Resistance from leaders, teachers, and students to adopting constructivist-based methods (Bell & Liu, 2019; Motta & Galina, 2023);
- Lack of availability of time and technological and financial resources (Motta & Galina, 2023);
- Difficulty in continuing experiential activities when teachers are changed (Simmons, 2021).

Source: Prepared by the authors based on the literature reviewed.

With regard to the situational diagnosis, the **documentary analysis** considered Brazilian laws and resolutions related to Brazilian TVET. This inclusion was important to identify existing guidelines in terms of educational practices. The main pedagogical principles identified were: i) the need for integration with society, ii) the adoption of active methodologies, and iii) the integration of teaching, research, and extension, with a view to the comprehensive training of students and not the fragmentation of knowledge.

From the interviews with 21 educators, one of the strengths identified was the high capillarity of the IFs, as they are located throughout Brazil, which allows them to establish direct connections with the entrepreneurship and innovation ecosystem and the community. The diversity of training areas for professionals is also an advantage, considering the multidimensional nature of entrepreneurship in different professional backgrounds.

Another positive aspect identified, although not predominant in all interactions, was the implementation of interdisciplinary experiential activities with a practical focus. Related research and extension projects were also mentioned as important practices, as they subsidize teaching activities, promote innovation, and provide space for students to develop entrepreneurial skills. However, there are limitations related to the implementation of EE that need to be addressed in the framework.

The **interviews** pointed to a lack of cohesion and discussion about the meaning of entrepreneurship in the institution, indicating a lack of clear strategic direction and specific policies. This deficiency affects the interdisciplinary approach in the curricula of the courses, indicating a lack at the philosophical level of EE (Fayolle, 2013).

In educational practice, some curricular and extracurricular initiatives are effective, but they are not fully integrated. Such initiatives depend on the individual motivation of educators, as formal support from the institution is insufficient (Stadler, 2017). With regard to experiential educational activities, greater integration is needed to ensure the interdisciplinarity of the subject in courses and the focus on authentic experiences, including teaching, research, and extension, in order to align the educational offer with the needs of students and the local and regional context. The stages of reflection and procedural assessment of learning could also be better structured to promote EL and TL.

The support structure for students wishing to develop autonomous entrepreneurial activities varies from campus to campus. There is a limited supply of learning environments that provide real entrepreneurship practice.

In terms of institutional support, limited financial resources were highlighted as a challenge that impacts on infrastructure and staffing. In addition, there are difficulties in internal processes, such as the establishment of partnerships and the continuity of educational practices already developed in processes of teacher replacement.

Design and Construction Stage

The first version of the EE Framework was structured based on the triangulation of data from the literature, document analysis, and interviews (Figure 2).

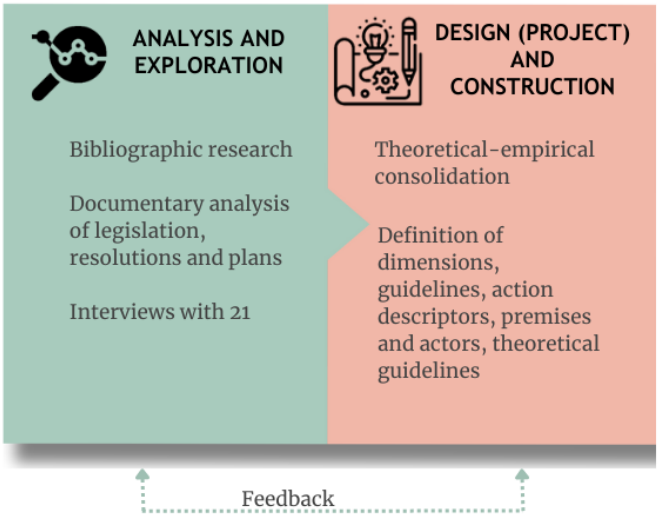

Figure 2: Structuring the Design and Construction Stage
Source: Prepared by the authors

In terms of learning theories, the first stage of the Educational Design Research showed that EL and TL are compatible with the organizational characteristics of the IFs, which are based on the integration of theoretical and practical knowledge, work as an educational principle, and emancipatory training. In EL, there is a bridge between experience, the world of work, and the educational context, facilitating the development of essential skills for adaptation, problems-solving, and innovation. TL, on the other hand, emphasizes the development of the individual's critical and reflective capacity to interpret the world, making them aware of their reality and their possibilities for action (Mezirow, 1981). This theory was included in the framework because of its emphasis on critical reflection and the need for new perspectives on the entrepreneurial profile and action in complex scenarios. From the perspective of the IFs, vocational and technical education is seen as a tool for building citizenship and social transformation (Federal Brazilian Law No. 11.892).

Structure of the Framework

Based on the identification of needs, premises, and challenges, the framework was structured into four dimensions that represent broad axes of action with the same focus and interrelated

characteristics and elements: (i) Shared Vision; (ii) Educational Practice; (iii) Relational; and (iv) Institutional Support.

The **Shared Vision** was inspired by Fayolle (2013), who discusses the philosophical level of EE, and Lindner's work (2020), which guides the creation of a value proposition for EE. This dimension integrates the internal meanings of entrepreneurship, the role of education and its actors, elements identified as lacking in the empirical field. This perspective is crucial for the direction and organization of education. It includes guidelines for the inclusion of EE in institutional plans and the collective co-creation of the meanings of entrepreneurship.

The **Educational Practice** represents the didactic level explored in Fayolle's models (2013) and includes teaching, research, and extension activities, both curricular (elective or mandatory) and extracurricular. This dimension is guided by a systemic and interdisciplinary vision that aims to develop students' autonomy. Its theoretical basis includes EL, TL, interdisciplinarity, transdisciplinarity, and active methodologies (Luchesi et al., 2022). The guidelines for this dimension focus on teaching methods, learning environments and the inclusion of entrepreneurship in the creation and updating of courses, with the aim of creating pedagogical pathways.

The **Relational** dimension encompasses the relationships established internally among faculty, educational technicians, managers, and students, as well as interactions with the external environment. It aims to ensure that the pedagogical approach is based on a shared understanding of the context and involves the active participation of the actors (Hunter & Lean, 2018). Actions include knowledge sharing between educators and between campuses, for interdisciplinary entrepreneurship and interaction with the entrepreneurship and innovation ecosystem, students and society.

The **Institutional Support** addresses financial, material, and support resources, as well as educator training and the mechanisms needed to develop EE. A constructivist approach requires resources, time to plan and implement activities, and ongoing training for educators (Bell & Liu, 2019; Motta & Galina, 2023).

Figure 3 illustrates the proposed framework. In the center are the four dimensions, which are interrelated. In the gray area, the words "authentic experiences", "protagonism", and "transformation" represent the main theoretical orientations of the framework (Kolb, 1984; Mezirow, 1981). The institutional context is represented by the outermost arc and the icons representing the actors (entrepreneurs, public and private actors, graduates, civil society organizations, and economic, social, environmental, and cultural factors).

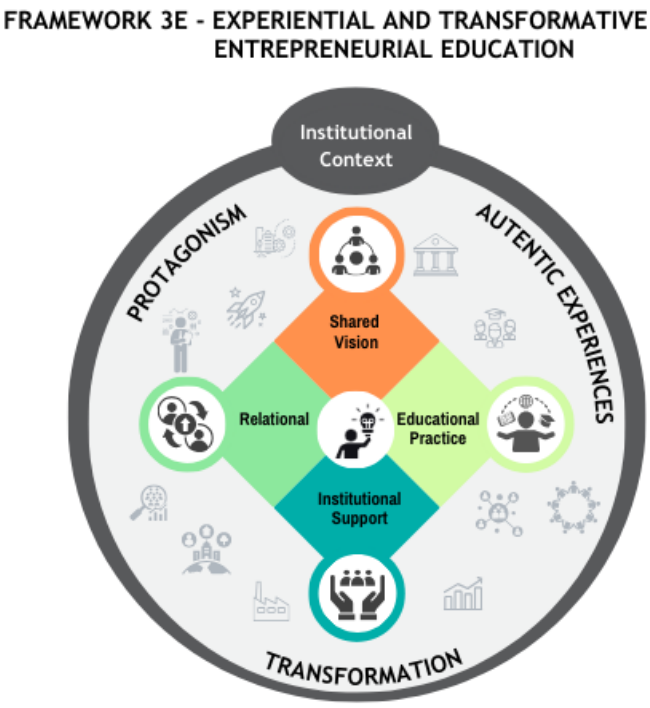

Figure 3: Framework 3E
Source: Prepared by the authors (2024)

Each dimension contains inducing guidelines, which provide guidance for action. For each guideline, descriptors were defined that specify possible actions based on empirical mapping and EE requirements. Premises were also defined, which are the explicit knowledge present in institutional documents, as well as the actors responsible for implementing each guideline. However, these elements are currently being evaluated and reflected upon by experts from the IFs (the third macro-stage of the EDR.

Conclusion

This research has elucidated the initial stages of building a framework to support entrepreneurial education in the context of Brazilian vocational and technological education, with a focus on students, supported by authentic experiences, and with an emphasis on transformative education. By using experiential and transformative learning theories as theoretical references, the research contributes to reducing the gap between education and entrepreneurship.

The chosen method – Educational Design Research – proved to be suitable for theoretically and contextually oriented research, favoring data triangulation and, above all, iterativity between phases.

Although the framework is still being evaluated in the context of a doctorate, which is considered a limitation, it is believed that its structuring in interrelated dimensions and guidelines can guide educational managers and educators in planning educational, administrative, and management processes, resulting in more effective impacts for students and society.

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