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New Pathways to Explore for Updating Engineering Curricula in Venezuela

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Abstract. The concepts and facts involved in university education are evolving rapidly, just as they are in all aspects of daily life. Recently, Industry 4.0 has emerged alongside Artificial Intelligence (AI)—elements that impose the need for capable, cutting-edge professionals who can face the challenges presented by highly technified organizations with self-governing cybernetic elements. One tool available to universities is the implementation of programs oriented toward Competency-Based Education (CBE), which argue that the knowledge to be taught goes beyond the mere transmission of knowledge; instead, they also seek to develop a set of skills, attitudes, aptitudes, and abilities that can ensure graduates achieve successful job performance. On the other hand, Venezuela requires university professionals called upon to fill the positions that will open given the expected economic recovery; hence, the need to evaluate aspects related to the accreditation of prior learning and the existing possibilities as alternatives for developing Special Degree Projects (SDP). Following the philosophical current of positivism and framed within qualitative evaluative research, the study presented here seeks to clearly establish the advantages of the CBE model and the aspects established in Official Gazette No. 42,903 regarding the accreditation of prior learning.

Keywords: Industry 4.0; Artificial Intelligence; Competency-Based Education; Special Degree Projects; Official Gazette 42,903.

1. Introduction

For several decades, Venezuelan universities have been working toward updating educational plans and curricula, aiming to reflect advancements in science and technology and incorporate the most salient features of the Competency-Based Education (CBE) framework.

With reference to the former, it can be noted that most programs are not adapted to current dynamics or have undergone only minimal changes. This occurs without considering that technology currently prevails over the theoretical world and that the Fourth Industrial Revolution (Industry 4.0) is an unquestionable milestone (Avella, 2026; Silva-Sprock, 2026; Silva-Sprock & Silva-Sprock, 2026).

Rivas-Echeverría (2025) explains that the modernization of engineering programs in Latin America faces a stark contrast: while the region seeks to align itself with advanced industry, the economic and political reality of each country dictates very different paces, even though this new revolution is impacting all productive sectors across nations and its arrival forces a reconsideration of what and how engineering is taught, as can be seen in figure 1.

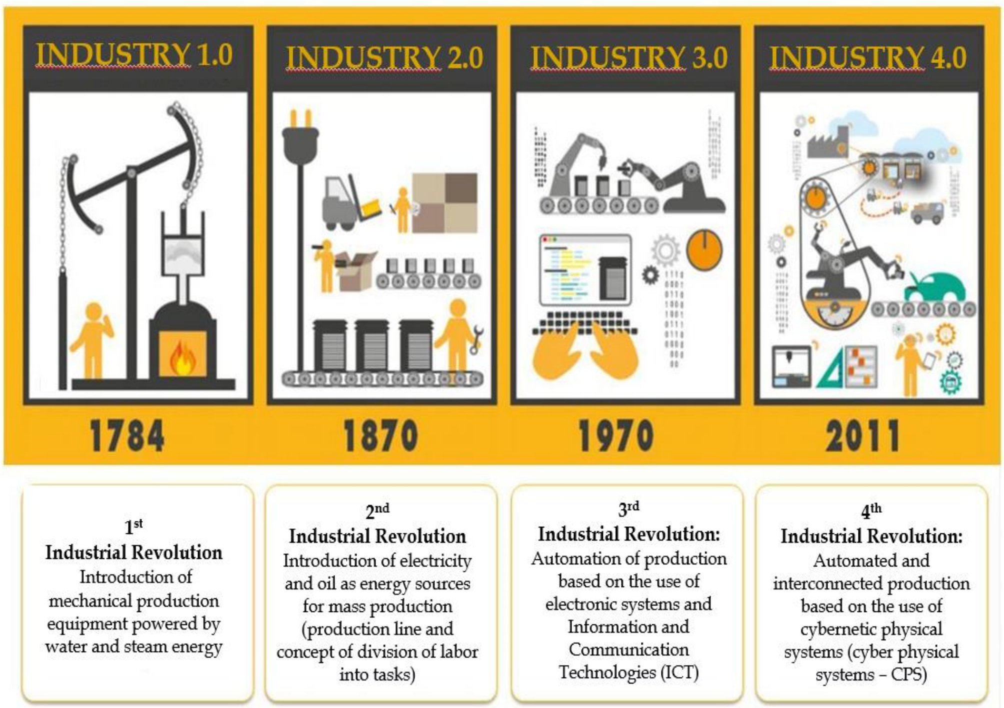

Figure 1. The 4 Industrial Revolutions. De los Ríos (2023)

This research work seeks to provide an innovative vision on how curricular redesigns in the field of engineering in Venezuela should be approached under a CBE framework. Furthermore, it considers the implications of Official Gazette No. 42,903, especially regarding the development of Special Degree Projects (SDP). This offers the possibility of shortening the university tenure of professionals with a high profile of theoretical-practical knowledge, given the urgent need to rapidly increase the number of graduated engineering professionals, particularly in light of the events that occurred in the country at the beginning of 2026.

The investigation makes a significant contribution within the framework of the Sustainable Development Goals (SDGs), specifically aligning with the provisions of SDG 4, which outlines the guidelines for quality education.

2. Methodology

Based on the provisions established by Arias (2016), who indicates that positivism is a philosophical current that emphasizes empirical observation, it can be established that the present research was based on the premises yielded by this concept and followed a qualitative approach supported by a literature review. On the other hand, Hernández-Sampieri and Mendoza (2018) explain that the qualitative approach makes predictions based on observed facts, and therefore, its prediction is predictable, with the path to follow being from the general to the specific.

The work presented followed the aspects framed within what constitutes evaluative research, which, according to Bisquerra Alzina (2009), aims to evaluate programs, policies, or interventions to determine their effectiveness and potential applications. These applications represent the goal of the work presented, since the evaluation will lead to conclusions regarding the most relevant aspects that must be developed in engineering programs established under the CBE paradigm and the policies recently issued by the national executive.

Furthermore, Cerda (2011) notes that documentary research involves searching for, obtaining, and examining previously completed resources, assembling them in a defined sequence so that they are useful to the study and contribute to explaining the phenomenon under investigation—an aspect widely utilized in this research.

Finally, it can be indicated that this study adheres to the ethical principles of educational research. The data collection was carried out by properly referencing the authors or organizations associated with each citation, thereby respecting their intellectual authorship and presenting reliable, easily verifiable data, which were utilized in the research analysis.

3. Content

3.1. The Arrival of AI and its Transformative Power

Artificial Intelligence (AI) has broken into all areas of daily life, and with particular force into events related to education, transforming not only the way of teaching but also the way exercises are assigned, evaluations are conducted, presentations are crafted, practical problems are developed, and any type of written work or monograph is executed. Its advent implies a world full of possibilities that will dizzyingly increase the scientific and humanistic development of humanity, given the following aspects (Miao & Holmes, 2023):

- Time Savings: It automates heavy tasks within the educational field, such as crafting exams, designing in-class exercises, improving electronic presentations, grading multiple-choice tests, or detecting grammatical errors. In the scientific field, it assists by searching for, analyzing, and processing information; finally, in the business sector, it streamlines how reports are generated, controls are maintained, or improvements are implemented, among other aspects.

- Accessibility and Inclusion: AI tools translate any type of material in real time, enabling individuals to access information regarding any topic of interest.
- Brainstorming and Creativity: It functions as a "sparring partner." It helps overcome blank-page syndrome by suggesting essay structures, generating study outlines, or creating images for visually impactful presentations.
- Simulations and Safe Environments: It allows users to practice languages without fear of judgment or to virtually simulate chemistry and physics laboratories, which reduces costs and risks across any educational or industrial setting.

However, just as the previously mentioned positive aspects exist, there are also negative elements that must be recognized by everyone and to which special attention must be paid.

- Decline of Critical and Autonomous Thinking: Cognitive laziness prevents individuals from deeply evaluating a specific topic and forming an independent opinion on it.
- Reference Recognition and Plagiarism: It becomes nearly impossible for the evaluator to determine what was produced by the participant and what was generated by the machine, thereby detracting from the originality of the work and eliminating due recognition of the original authors who addressed the specific subject.
- Information Bias: AI does not always provide accurate data; outputs may be induced or aligned with specific interests, either because certain entities could seed collective cyber-memories with incomplete truths, or to serve the interests of nations or major tech corporations.
- The Digital Divide: Its utilization is strictly conditioned upon the user's access to hardware, electricity, and an internet connection; without these, accessibility to its use is entirely restricted.

All these elements, both positive and negative, imply a deep reflection on the use of this computing tool and how it must be precisely incorporated into engineering curricula.

3.2. Competency-Based Education (CBE)

In Venezuela specifically, the Central University of Venezuela (UCV, acronymic in Spanish) is a pioneer in curriculum design based on the CBE framework, having created the Industrial Process Engineering program in 2005, which was formally approved in 2008 by the National Council of Universities¸ (CNU, acronymic in Spanish). Therefore, it can be stated with authority that a long track record of experience exists in this regard within the country.

To understand this concept, it is crucial to establish how CBE developed, starting with Chomsky (1965), who recognized the need for discourse as a competence required by professionals, and leading to the first scholar who envisioned the importance of human competencies as an instrument required by individuals to achieve success—an aspect promulgated by McClelland (1973). Later, Gonczi (1994), established the existence of the attributes required to perform occupational tasks, which, as indicated by Morin (1999) and Rué (2007), must be integrated so that, as established by Tobón (2010), they can be manifested across different scenarios, aspect shown in Figure 2.

Figure 2. Development of the CBE Concept

Subsequently, the concept of CBE fundamentally encompasses five key areas to be developed, which are:

- Knowing: Knowledge, concepts, theories, and criteria.
- Knowing How to Do: Technical, social, and cognitive skills.
- Knowing How to Be: Attitudes, values, and beliefs.
- Wanting to Do: Aptitudes and motivation.
- Being Able to Do: Abilities and personal capacity to perform tasks.

All these aspects are ultimately linked by Guillén and Soret (2022), who indicates that labor competencies are the 'set of knowledge, skills, attitudes, aptitudes, and abilities that lead a professional to achieve successful job performance.' From this, it follows that to define and establish educational programs under the CBE framework, the following fundamental premises must be met—which are also mostly valid when updating educational plans:

- Alumni Opinions.
- Employer Opinions.
- Evaluation of Global Content Trends.
- AI Assistance.

3.3. New Teaching Trends and Their Impact in Venezuela

Within this context, it can be indicated that in Latin America, institutions such as the Inter-American Development Bank (BID, acronymic in Spanish) and International Centre for Engineering Education and UNESCO (2021) - International Institute for Higher Education in Latin America and the Caribbean (IESALC, acronymic in Spanish), have been proposing a transformation in curricular structures, establishing three fundamental pillars:

- STEAM Approach and Soft Skills: The objective is no longer solely mathematical rigor, but rather complex problem-solving paired with ethical principles and personal leadership development. It is important to mention that the STEAM approach integrates into its acronym the words Science, Technology, Engineering, Arts, and Mathematics. Espinosa (2024) indicates that the application of this methodology yields a significant increase (greater than 70%) in creativity, academic performance, and critical thinking, which is fundamental in the daily practice of engineers within the workforce.
- Micro-Credentials and Flexible Pathways: Universities in Chile, Mexico, and Colombia are allowing students to "build" part of their degree program through short certifications. In Venezuela, these experiences are already present in some universities, where prior knowledge is accredited or complemented by graduate diplomas, offering the opportunity to shorten university residency times.

A significant group of universities in Venezuela is already incorporating programs for the accreditation of knowledge and experiential learning. This allows professionals with extensive work experience to validate their prior knowledge—acquired through employment or non-university courses—and fulfill curricular units included in the degree program.

Below is a list of national universities that have been working with knowledge accreditation programs (as can be seen in Figure 3), along with the date since these programs became established:

- UNESR (Simón Rodríguez National Experimental University): A pioneer in the accreditation of knowledge, it has been implementing this process in programs such as Food Engineering and Agroecological Engineering since 1981.
- UPEL (Libertador Experimental Pedagogical University): It has accredited prior knowledge since 2003.
- UNELLEZ (Ezequiel Zamora National Experimental University of the Western Plains): It accredits knowledge across all its faculties, including engineering, since 2005; this initiative gained significant renewed momentum in 2020 with the support of PDVSA.
- UNEG (National Experimental University of Guayana): It has conducted knowledge certifications since 2009 in the field of engineering, supporting

workers from the basic industries of Guayana in obtaining university degrees.

- UPT (Territorial Polytechnic Universities): They have been certifying knowledge since 2012 in the fields of Maintenance, Computer, Electrical, and Mechanical Engineering.
- UY (Yacambú University): It updated its regulations in 2022, thereby facilitating the certification process of professional competencies for students to advance through their study plans.
- UCAB (Andrés Bello Catholic University): It carries out knowledge certifications across all its faculties (including engineering) following the approval of an internal regulation for the recognition of experiential learning and knowledge in April 2024; this framework allows the accreditation of up to 50% of the curricula in Civil, Industrial, Computer, and Telecommunications Engineering.
- UFT (Fermín Toro University): It accredits prior studies since 2024 across all degree programs offered by the university, including those in the engineering field.
- UAM (Arturo Michelena University): Since 2024, in alignment with the new guidelines issued by the Ministry of Higher Education (MES), it has launched an accreditation program for Higher Technical Squares (TSU) to obtain their university engineering degrees in a shorter timeframe.
- UNERMB (Rafael María Baralt National Experimental University): It has been offering knowledge accreditation programs since 2024 in degree fields such as Gas, Maintenance, and Computer Engineering.
- UNEARTE (University of the Arts): It has been accrediting knowledge, notably highlighted by an event in 2024 where university degrees were certified and awarded to more than 100 master artisans and artists with extensive career trajectories.

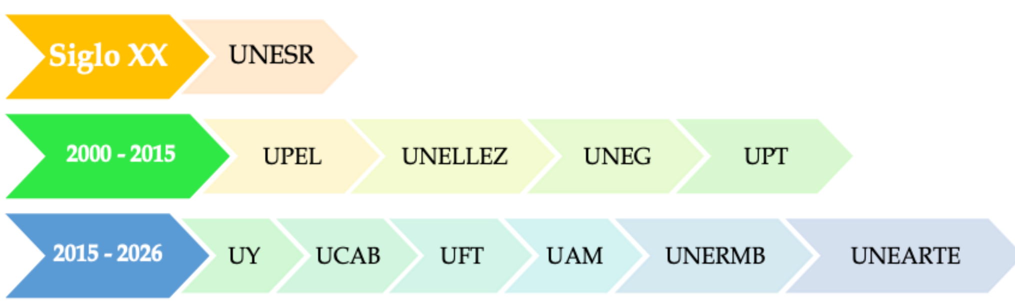

Figure 3. Growth of Universities that Accredit Knowledge. Summary

- AI Integration and Digitalization: Once again, regarding AI, it must be noted that educational programs are already incorporating generative AI and data analytics transversely across all engineering branches, supporting design through virtual laboratories and simulation equipment that provide the visualization of real working conditions.

3.4. The Case of Venezuela: Resilience and Adjustment

In Venezuela, the process of curricular transformation exhibits a dual nature. In most universities, this transition progresses at a highly sluggish pace, primarily because the teaching staff has not fully embraced the need for change. Depressed salaries and a lack of incentives for research leave professors unmotivated and hesitant to confront the new challenges demanded by approaches such as Competency-Based Education, resulting in a deeply entrenched adherence to traditional curricula and teaching methodologies.

However, as previously noted, a wide diversity of criteria emerges when reviewing the educational plans across the country's various universities, as detailed below:

- Autonomous Universities (UCV, ULA, LUZ, USB, UC, UDO): These institutions possess academic programs with highly solid foundations; however, they face extreme difficulties in upgrading laboratory equipment and technology due to severe budgetary constraints. To combat student attrition and faculty shortages, they have driven reforms aimed at shortening degree programs (reducing them from five to four years in certain cases) and digitizing course content. The implementation of Virtual Classrooms (Aula Virtual), which gained significant momentum during the 2020 pandemic, has now consolidated into an essential supportive pedagogical tool.
- Private Universities (UCAB, UNIMET): These institutions lead the way in technological updates. For instance, UCAB has recently inaugurated 3D printing and robotics laboratories, alongside introducing new specialized tracks within its programs aligned with the demands of the global market (2024–2025). Furthermore, they offer intermediate qualifications and diverse options for the accreditation of prior learning.
- State-Sponsored Approach: The State promotes National Training Programs (Programas Nacionales de Formación – PNF), which seek a direct linkage with public industry. However, these programs are frequently critiqued for their ideological weight or their lack of technical depth when measured against international standards.

4. Discussion

4.1. Competency-Based Programs

Unlike the conventional approach typically executed when modifying engineering curricula—where updates are introduced based solely on the academic vision or personal experiences of a specific faculty's teaching staff—introducing aspects related to the CBE framework, which entails integrating the five previously defined thematic areas, imperatively demands transcending the university sphere. It requires shifting the protagonism in content formulation and skill requirements toward graduates, managers, and employers. Ultimately, it is these external stakeholders who will determine, throughout the graduate's professional career, whether their workplace performance is successful.

Within the field of engineering, explain Lattuca, Knight, & Novoselich (2017) the curricula formulated under the CBE framework represent a significant advancement in knowledge transmission, particularly given the practical and project-driven nature of this discipline, as demonstrated by the model comparison presented in Table 1.

Table 1. Comparison of traditional models vs. CBE

Analysis Criteria	Traditional Model	CBE
Main Focus	Structured theory and memorization of syllabi	Practical application of knowledge in real-world contexts
Assessment	Single numerical grade (one-off exam)	Consistent demonstration of skills (rubrics)
Progress	Measured by face-to-face time (semesters/hours)	Measured by verified mastery of the competency
Learning Pace	Uniform for the entire class group	Personalized and flexible according to each student

The rapid adoption of the CBE framework is driven by the factors previously illustrated, where the practical application of imparted knowledge, the assessment and measurement of achievements based on a rubric that weighs performance according to specific competencies, and the flexibility to adapt programs to each student's profile make classes more dynamic, engaging, and motivating for participants to complete the established activities.

The next major question that emerges is whether the adoption of a curriculum designed under a CBE scheme is truly beneficial for both graduates and employers. This is demonstrated by the data presented in Table 2, which outlines the outcomes of implementing the CBE model according to various international organizations, with an emphasis on Latin America. These findings unequivocally indicate the necessity for universities to adopt these educational plans.

Table 2. Results of the Implementation of the CBE Model

Condition	Result	Referring
Job Placement	Graduates under the CBE scheme outnumber graduates under traditional schemes by 20%.	Gallup/WGU (Western Governors University) 2025
Skills Mismatch (*)	40% gap between what is certified by traditional educational centers and the	CEPAL, OIT & CAF (2025)

	skills required by managers	
Inadequate Profile Regarding the Job Position in Graduates Under CBE	Only 12-15% of graduates fail, and not because of the CBE, but because of the obsolescence of the company itself	Basco et al. (2020) / Salazar-Xirinachs & Vargas (2020)
Requirements in Retraining Plans upon Entering Companies	Only 15% of hired staff require retraining plans, usually brief ones	Lattuca, Knight, & Novoselich (2017)
(*) Research indicates that when engineering faculties integrate competency maps built jointly with industry, this gap falls to 15% (OECD/CEDEFOP/Amaral et. al (2017) = in Engineering in Latin America it exceeds 40%).		
CINTERFOR = Inter-American Center for Knowledge Development in Vocational Training		

Ultimately, according to Goel and Kovács-Ondrejkovic (2023) and the National Institute of Professional Training of Chile (INACAP) (2023), graduates from universities with established curricula designed under the CBE approach—which directly respond to the needs of the business and professional sectors—are 88% less likely to experience adjustment or adaptation difficulties in their first formal, paid employment.

However, indicators directly related to productivity and industrial activity also exist when determining the extent of improvement observed in processes managed by personnel trained according to CBE principles, as shown in Table below.

Table 3. Impact on the Industry of the CBE Model

Industrial Indicator	**Average Impact as a Percentage**	**Referring**
Direct Labor Productivity	+23% average increase	Marginal Productivity Studies. Konings & Vanormelingen (2015)
Innovation Success Rate	+93.3% positive impact	Systematic Reviews in Industrial Sectors. ABET (2023)
General Competitiveness	+88.9% perception of improvement	Organizational Performance Regression Studies, Farawowan & Hardianti (2025)
Rotation Reduction	-15% to -25% decrease in resignations	Retention and Climate Metrics. Carol (2025) / Eaton et al. (2023)
Reduction of Operational Errors	-20% to -30% in failures or waste	Lean Manufacturing and Competency Reports, Varol (2024) / Zigpoll (2024)

It is essential to emphasize that for these percentages to be realized, universities must ensure that their programs possess industry relevance—meaning that instruction aligns precisely with current factory floor requirements—and that assessment remains practical rather than confined to theoretical classroom settings, as previously discerned.

This accumulation of data also highlights the imperative for academic planners and university faculty to establish continuous review protocols for curricula oriented under the CBE philosophy, given that the half-life of skills today ranges from a mere three to five years. The World Economic Forum, in its biennial Future of Jobs Report (2016), explained that the average "useful life" of a skill plummeted from 30 years in the 1980s to just 5 years by 2016. Similarly, recent studies by the Goel & Kovács-Ondrejkovic (2023) and Fuller & Langer (2023) established that the half-life of taught competencies is indeed around 5 years, though this window drops to approximately 2.5 years when dealing with technological activities.

Finally, Thomas and Brown (2011) were pioneers in quantifying this competency obsolescence phenomenon, mathematically demonstrating that the half-life of a technical skill is a mere 5 years. Collectively, these arguments underscore the critical necessity for the permanent evaluation of competencies, encompassing both technical skills and those fundamentally related to human aspects.

4.2. The SPD and the Implications of Official Gazette 42,903

The modernization of engineering curricula cannot be restricted solely to the need for adapting them to the new reality of the 21st century; it must also integrate the knowledge and expertise acquired by individuals through years of professional practice, while offering intermediate qualifications for those who require them.

In the case of Venezuela, the socio-economic situation has driven massive student attrition. According to reports from the latest ENCOVI survey (UCAB, 2026), university dropout rates in Venezuela fluctuate between 60% and 70% when compared to the historical peaks of the past decade. A clear example substantiating these figures occurred at the Armando Mendoza Engineering Center of the Faculty of Engineering at the Central University of Venezuela, located in Cagua, Aragua State; its student enrollment plummeted from approximately 1,200 students in 2018 to just under 220 in 2026.

This precipitous decline in enrollment stems from a multiplicity of factors rooted in the country's socio-economic landscape, which currently remains unchanged. Nonetheless, events at the beginning of January 2026 glimpse a medium-term improvement in productive sectors and employability. Consequently, it is necessary to provide realistic, timely alternatives to a vast group of individuals, entrepreneurs, and government entities that will require qualified engineering personnel. This situation demands leveraging individuals who possess extensive experience and outstanding competencies, enabling them to offer solutions within their fields without compromising their employment or forcing them to leave their current positions.

In developed nations, the engineering undergraduate thesis (SPD) is usually tightly linked to Research, Development, and Innovation (R&D+i). Universities operate within an "Innovation Ecosystem" where students access state-of-the-art laboratories, corporately licensed software, and private funding. The focus is predominantly technological and optimization-oriented, aiming for patents or scalable solutions tailored to Industry 4.0.

Conversely, in underdeveloped nations, the SPD typically focuses on adaptation or basic problem-solving. Due to resource scarcity, engineering students must frequently design their own prototypes using low-cost materials or focus on feasibility studies and diagnostics. Research tends to be more documentary or applied field research rather than high-level experimental laboratory testing.

In highly industrialized countries, the concept of the SPD differs completely from the model known in Latin America and particularly in Venezuela. In North America and Australia, Capstone Projects take precedence; these are group-based applications within the industry where a student's performance inside the organization constitutes the core evaluation, according Dutson et al. (1997).

On the other hand, in Europe, the SPD is usually concise and competency-focused, offering additional pathways such as extended internships (6 months), supplementary design courses, or comprehensive examinations (European Commission: European Education and Culture Executive Agency, 2020). In Japan, SPDs typically derive from ongoing laboratory research and, therefore, represent practical applications of the knowledge imparted by the university.

This situation changes entirely in underdeveloped nations, especially in Latin America and Africa. Generally, in these regions, SPDs are extensively long, following a structural framework modeled after classical doctoral dissertations (consisting of five or more chapters) that often fail to deliver a significant contribution to society. These documents feature complex methodological frameworks and extensive theoretical sections easily accessible on websites or in libraries, paired with laboratory assays or tests conducted on obsolete equipment with inadequate materials—frequently yielding results that do not solve real-world problems and rely on unverifiable data.

Additionally, professional internships lasting between 10 and 18 weeks carry no academic credit, a limitation that also applies to advanced professional courses or diplomas. Most critically, accumulated professional experience—which often spans half-decades or even decades—is neither recognized nor validated.

Table 4 illustrates this described reality: while in developed nations undergraduate theses either do not exist or the requirement is limited to compiling a report on practical internship or laboratory outcomes, underdeveloped nations maintain highly bureaucratic structures.

Table 4. SPD in the World

Region	Does the Traditional Thesis Exist?	Main Requirement	Term
EE. UU. Canadá Australia	Rarely in undergraduate studies	Capstone Project (Group and practical)	Within the Programs
Europa / EACEA (2020)	Yes, simplified or alternative internships or additional courses	Special Project Degree (SPD) focused on competencies	2 to 3 month
Japón	Frequent	Integration into a Research Laboratory (one full year)	4 to 12 month
Underdeveloped countries	Very common	SPD Individual, extensive and with a heavy bureaucratic burden	12 to 36 month

In 2024, specifically on Tuesday, June 18, the Ministry of People's Power for University Education published at the Official Gazette of the Bolivarian Republic of Venezuela No. 42,903, establishing the "Guidelines for the Accreditation and Certification of Prior Experiential Learning and Knowledge (2024)". These guidelines emerged from the following fundamental premises:

- The need to guarantee the lifelong learning process.
- The promotion of universality, quality, and relevance within the educational sphere.
- The opportunity to accredit and recognize learning, inventions, experiences, and knowledge acquired both within and outside the formal educational system.
- The deepening of comprehensive and continuous training processes.

Based on these considerations, the national executive formalized procedures that, as previously mentioned, were already being developed across several national universities. Among the fundamental aspects of these guidelines, the following can be highlighted:

- The possibility of conferring academic degrees in both degree-granting and non-degree-granting programs.
- Facilitating academic progression by recognizing experiential learning, skills, abilities, and expertise that can be directly applied within the corresponding curriculum.
- The establishment of standard methodologies and formalities aimed at evaluating and validating knowledge to formalize its accreditation.
- The recognition of distinct learning typologies:

- Formal: Approved and completed at recognized universities.
- Non-Formal: Completed as part of training or professional development courses provided by corporations or non-university institutions.
- Informal: Derived from hands-on practice in the workforce and accumulated over years of professional experience.

The regulatory aspects regarding the ACASE system establish, clearly and unequivocally, that all knowledge acquired over the years may be accredited toward any course within the degree program chosen by the applicant. Consequently, the undergraduate thesis (SPD) is also included. Therefore, the framework enables the establishment of guidelines to recognize professional practice as a final capstone project, making it possible to confer academic degrees upon a vast number of students who suffer from the so-called “ABD syndrome” (All But Dissertation).

Numerous obstacles impede the progression and completion of university studies in Latin America and Africa, and most particularly in Venezuela. Currently, it is of paramount importance to seek alternative pathways to graduate the required workforce. This challenge entails not only recognizing prior learning and simplifying—or even eliminating—highly complex SPDs, but also requires universities to forge closer relationships with the productive and commercial sectors of their countries. Such integration is vital to accommodate students in their final academic terms, enabling them to gain the necessary workplace expertise.

5. Conclusions

Following a comparative analysis of the aspects examined in this research paper, the following conclusions can be drawn:

1. Curricula Established Under CBE Models: these programs offer a multiplicity of advantages over those established under a traditional objective-based approach. Among these benefits, numerous studies conducted by international bodies have established that graduates trained under the CBE framework exhibit higher labor insertion rates and smoother adaptability to the workforce, particularly regarding their first employment. Additionally, evidence shows that graduates from CBE-oriented programs are more productive from an operational standpoint, drive organizational change and innovation, demonstrate greater employee retention, and commit fewer errors in their duties.
2. Undergraduate Theses (SPD): while the graduation process in developed nations is designed as a bridge toward immediate employability through practical projects or internships, the SPD in underdeveloped countries continues to function as a complex, and frequently traumatic, academic validation barrier. Although this traditional framework fosters remarkable theoretical resilience, it often delays the engineer's entry into the productive sector due to its excessively documentary and bureaucratic focus. In

emerging economies, precarious laboratory conditions, lack of technological supplies, and workplace demands often force students to spend an average of over 36 months developing their SPD. This transforms the process into an exercise of economic endurance rather than academic rigor, leading many students to leave their degrees incomplete, falling into the "ABD syndrome" (All But Dissertation).

3. Consequently, to bridge this competitive gap, engineering faculties in underdeveloped nations must transition toward more agile assessment models. Adopting international accreditation standards that align with the future of global engineering promotes the principle that earning a degree does not hinge on drafting extensive monographs, but rather on the capacity to execute industry-ready technical projects that solve local problems with global standards.
4. Official Gazette No. 42,903 of the Bolivarian Republic of Venezuela: although various degree programs in Venezuela have already removed the SPD from their graduation requirements, multiple university faculties across the country frequently resisted promoting the certification of prior learning, arguing the absence of a regulatory framework governing this matter. The resolution established in the Official Gazette regulating the ACASE system now provides a mechanism for a vast number of students—who possess extensive professional trajectories and proven expertise—to pursue a university degree through a more expedited pathway without the necessity of drafting a long SPD. Therefore, this legal instrument must be studied and implemented by national universities as a matter of urgency.
5. Limitations: this study is limited to the academic realities investigated in the Bolivarian Republic of Venezuela, particularly regarding the applicability of Official Gazette No. 42,903 and the evaluation of the educational offerings related to this aspect across the universities established in the country.

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