

Duoc and the Higher Vocational Technical Education in Chile

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Abstract:

The paper examines the historical development and distinctive features of Duoc, a prominent institution of higher technical education in Chile. The historical context reveals the evolution of technical and vocational education in Chile, tracing it from early initiatives targeting employment-oriented education to the significant policy shifts in the later part of the 20th century. The paper highlights the pivotal role played by the expansion of post-secondary technical education, the distinctive educational model emphasizing practical training and competency-based learning, and Duoc's ability to adapt to evolving societal needs. Key features of Duoc's experience are the proactive efforts to meet the evolving labor market demand and changing student profiles pursue of the alignment of its programs with the job market needs, a systematic approach to quality control.

Since the colonial era in Chile, different Catholic orders saw the technical and vocational education as a way out of the circle of poverty for the children of peasants and illiterate workers. However, these early efforts were isolated and didn't find support from the State. The primary education law of 1860 focused on the University (Universidad de Chile) and the "lyceums" which had a humanistic and preparatory character for university admission.

The public debate on the role of technical and vocational education began in 1872 when the Secretary of Education Abdon Cifuentes proposed a curriculum oriented towards employment, emphasizing the need for "true geniuses in the industry" rather than "perverse intellectual writers." In turn, intellectuals like Valentin Letelier opposed the creation of technical institutes, considering them useless or less serious than a baccalaureate (Dittborn, 2007).

In the early 1900s, the technical and vocational education started to take shape. The 1920 Primary Education Law divided schools into elementary, higher, and vocational schools, with a focus on work-oriented education. President Pedro Aguirre Cerda, in 1925, advocated for technical-agricultural instruction. At the higher level, Federico Santa María, in 1919, donated part of his wealth for the construction of a technical university in Valparaíso. This led to the creation of the Catholic University of Valparaíso in 1928, which included the Industrial Polytechnic Institute and schools for civil construction, mechanical, electrical, and radiotelephony sub-engineers. In 1947, the School of Arts and Crafts was incorporated into the State Technical University in Santiago.

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In 1965, the government of Eduardo Frei Montalva increased mandatory basic education from six to eight years and introduced two four-year modalities: scientific-humanist and technical-professional. In 1967, the National Institute for Professional Training (Inacap) was created to provide advanced courses in technical trades for adults. Around the same time, Duoc was founded by the Catholic University to teach blue-collar workers and peasants to read and some basic skills (Casanova, Gonzalez, and Salas, 2019).

Despite a lack of public financing, Duoc experienced significant growth in its early years, supported by the enthusiasm of its founders, European NGO funds, and the voluntary work of students from various schools. Due to the high illiteracy in adults, admission to Duoc had no academic requirements. Thus, most courses were designed to be taught without the need for reading, as the tailoring classes that used ropes and knots instead of measuring tapes (Casanova, Gonzalez, and Salas, 2019).

During the early years of the military regime, which overthrew President Allende in 1973, the government's focus was on the huge public deficit, not on education. Although Duoc was viewed with some apprehension by the military regime, its affiliation with the Catholic University and the support of the unwavering Cardinal Silva-Henriquez, gave it certain immunity that prevented the persecution that took place in universities.

After urgently addressing the fiscal deficit and tackling significant price distortions, the dictatorship initiated a series of structural reforms aimed at making a lasting impact. Among these reforms were an unprecedented privatization process, a comprehensive labor reform, and an educational reform that encompassed all levels of education.

In the realm of higher education, the reform aimed to increase coverage, which was considered low given Chile's position and the prevailing circumstances at the time (refer to Urzúa and Ferrera, xxxx). The low coverage was attributed to institutional constraints, common in many Latin American countries, where the notion of the State as the sole provider and financier of universities created significant resource limitations.

The milestone for the reform came in 1981 when a shift towards post-secondary education and the expansion of institutions like Duoc, Inacap, and AIEP (originally established as a language school) took place. These institutions that had moved towards post-secondary education, were granted the ability to offer higher-level technical degrees simply by presenting a project showcasing their educational capacity to the Ministry of Education.

However, the reform faced staunch opposition from universities, particularly the University of Chile, resulting in a pro-university bias. The law considered universities as the pinnacle of education, conferring them the exclusive authority to grant academic degrees and receive government funding. Moreover, while universities were prohibited from making a profit, technical institutions were allowed to do so, further highlighting the bias.

Although the reform expanded the sector, students in the professional technical sector did not receive significant public financing until 2001. Starting from that year, students from these institutions became eligible for state loans, resulting in an increase from 3% of students receiving state contributions in 2002 to 72% in 2020. The high percentage of students in the technical sector that receive public funds is due to their socioeconomic profile. Traditional universities, which have stringent admission requirements, tend to enroll students from higher-income families and prestigious, expensive schools. On the other hand, technical professional education does not have the same preselection criteria. Thus, in 2011, 20% of Duoc students belonged to the first decile, a percentage that doubled by 2020. Conversely, there is some underrepresentation of students from the fifth decile, with only around 10% of Duoc students coming from that decile.

Distinctive Features of Duoc

With the advent of universal public financing, higher technical-professional education experienced consolidation, particularly in the case of Duoc. Thus, Duoc not only became the largest institution of higher education (including technical-professional and university programs) with a 8.8% participation of total enrollment in 2019 (pre-pandemic), but also attained the highest quality accreditation, that only Universidad Católica and Universidad de Chile had. This distinction stemmed from Duoc's direct association with the Catholic University, recognized as one of the top institutions in Latin America in several international rankings. Thus, on the one hand, Duoc had to pursue high quality standards. On the other, and more important, it had to find a distinctive place in higher education to the one the universities were expected to have. Thus, since the early stages Duoc looked for curriculum design and teaching methods that were unique, where learning by doing, developing prototypes, developing competencies and implementing conceptual models were its characteristic.

In contrast, AIEP, Santo Tomás, and Inacap, three institutions with a strong reputation and participation in the technical education sector, sought to assimilate and resemble universities. To varying degrees, they interconnected the curricula of technical and university programs, treating technical education as a steppingstone towards a university degree. While this deviation had some attractiveness for some students, it was met with disapproval by the quality accreditation system. Meanwhile, Duoc's strategy, which emphasized the fundamental training of technicians and their distinct profile complementing that of university professionals, gained support from the accreditation system.

Quality control became particularly sensitive because the rapid growth and consequent size. With over 100,000 students, 2,500 workers, and 4,000 teachers, the standardization of processes was a must. The challenge, achieving a balance between standardization, curriculum updates, and the preparation of students and teachers.

It would be misleading to suggest all programs receive good evaluation. What seems fair is to recognize a capacity to adapt, to close many programs poorly evaluated and that, given the substantial changes brought about by the COVID pandemic, many of those initiated after 2015 have not enough evidence to have a complete diagnosis. Nevertheless, considering the consistency of these programs with Duoc strategic plan, a clearly defined diagnoses of the role of the technical education and its challenges, and the efforts made to provide systematic evaluation, most programs are well-designed. In particular, project evaluation was explicitly considered as a requisite and to that purpose, Duoc created a Studies Unit in 2016, responsible for directly evaluating the programs and acting as a counterpart to specialized external evaluators.

To favor employment, the continuous curricula adaptation is necessary, and this need has become increasingly apparent over the past decade. In 2015, Duoc declared to favor employment as its main purpose. This led to define metrics for evaluation purposes and to redefine the curricula as the main mechanisms to attain the objective. By incorporating feedback from various firm executive groups, become clear that graduates lacked management and employability skills, particularly critical thinking and teamwork. Consequently, the competency-based education model was updated aligning it with Tuning Latin America focused on "21st century competencies" that were integrated into transversal programs (common courses to all careers). In 2018, a baseline to evaluate the acquisition of these competencies for all students starting that year was defined. The process of implementing these curricular adjustments, known as CAPE (Creation and Update of Study Plans), was carried out on a massive scale and was in full swing in 2020.

Apart from curricular design, there was a regular evaluation of the relevance of study programs. Each program is assessed based on three dimensions: employment rate, income, and the relevance of the occupation to the study program. If any career consistently shows low employability rates compared to the rest of Duoc, the program must be reformulated, adjust the number of vacancies, or closed. Despite the generally low employability rates in the higher education system, this dynamic enabled to restructure the career composition and to achieve the highest employability rate among all technical institutions.

Another distinctive challenge in the technical education system addressed is that of teachers. It is widely acknowledged within the professional technical sector that, for a relevant set of courses, the profile of a "good teacher" differs significantly from that required in university education. Effective teaching in technical courses require to continuously update the skills taught, as they quickly become obsolete. The skills of a maintenance shop manager at Caterpillar, a brake mechanic at Toyota, or an electrician in charge of a distribution company hold substantially more value than a Ph.D. in mechanics and engineering. Publications in high-impact journals neither determine the quality of teaching in the technical context.

Duoc has made innovative strides in teaching, particularly in the evaluation and restructuring the teaching staff. To that end, it defined the desired teacher profile based on measurable characteristics that show high conditional correlation with the results of cross-sectional exams across different courses. In 2018 a categorization of the teaching staff started, linking this categorization to remuneration and hierarchy.

Additionally, although not as massive as the curricular changes or teacher restructuring, Duoc implemented two projects involving a significant participation of private companies. The construction of the Arauco Campus as a pilot experience and the new Nacimiento Campus were financed by the country's main forestry companies, which appointed representatives to serve as advisors. The curricula for these projects do not differ significantly from traditional programs but are implemented using a modality comparable to dual education. In these cases, the companies provide technicians and professionals who have undergone training for teaching and evaluation. These individuals act as monitors for students' work at the plant, with shifts reaching up to 50%. Graduates from these programs have virtually assured employability.

Furthermore, recognizing the substantial changes in training needs resulting from deficiencies in school training, especially among students coming from vocational technical secondary education, and the expectations of younger students, Duoc implemented massive programs that have set precedents. One particularly significant in the academic area is the Zero Quarter, which involves an intensive leveling period in math and language. The ex-post evaluation of this program has shown a significant impact on mathematics but not as much in the case of language.

In response to changes in student profiles, particularly those attending daytime sessions, as well as to the growing pressure for political participation, Duoc implemented participation programs in various spheres. These initiatives encompass the promotion of sports activities, the establishment of orchestras and choirs, the creation of leadership schools, and the election of student representatives. Although student participation had historically been considered unnecessary in the sector due to concerns about conflicts, strikes, and takeovers, it became evident in 2015 that the interest in extracurricular activities could not be suppressed. While the COVID pandemic has hindered the systematic evaluation of these programs, the absence of internal conflicts, which were exceptionally rare during a turbulent period of recent history when most higher education institutions experienced takeovers, suggests that these initiatives have effectively channeled demands for participation.

The recognition of Duoc as the most prestigious institution in higher technical education in Chile, showed by the accreditation system and the interest of students seeking non-university professions, is the result of a systematic approach, effective governance, and precise objectives. In addition to these foundational pillars, Strategic Planning and evaluation play a critical role. It is worth noting that not all initiatives and ideas have succeeded over the years, but this is not a problem, as systematic evaluation has become a prerequisite for transitioning pilot programs into massive ones.

Most programs are initially implemented in a select few careers and, at most, in two out of the twelve campuses. Subsequently, they undergo a comprehensive ex-post evaluation, primarily conducted by the Studies Unit. In certain cases, specific programs are designed as controlled experiments. For instance, the implementation of critical thinking in language courses involves randomly assigning students to different sections, with some following the traditional course and others using new methods. In essence, Duoc's success stems from its commitment to persevere with promising ideas and swiftly discontinue those that prove ineffective, all guided by a well-defined decision-making process.

References

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