QUALITY REFERENTS IN ECUADORIAN HIGHER TECHNOLOGICAL EDUCATION

Referenciales de la calidad en la educación tecnológica superior ecuatoriana

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Abstract

The quality in technological higher education is better characterized by the training of students' capacities than by the levels reached in accountability or institutional management. By virtue of the specialized literature, there have been two major approaches that have characterized the issue of quality in Higher Education in the last decades. From an administrative perspective, the commitment has been directed to quality management; and from social studies perspectives the focus was on promoting the institutional culture. In this framework, the study aims to characterize the quality references underlying the evaluation models of the Higher Technological Institutes in Ecuador from 2010 to 2020, to make visible the need to rethink public policies from the State and strengthen the agency of institutes. To achieve this objective, the theoretical instruments of policy analysis were used through a review of documentary information that allowed reinterpreting the concept of quality. Finally, as a conclusion, the study determined that the prevailing concept of quality in the evaluation models of the IST was adjusted to the acquisition of high levels of excellence and did not include the discussion of the nature of the technical and technological training relative to the transformation of students' abilities.

Keywords

Quality, education, institutes, technology, models, evaluation, policy.

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Resumen

La calidad en la educación superior tecnológica se ha caracterizado mejor por la formación de las capacidades del estudiantado que por los niveles alcanzados en la rendición de cuentas o en la gestión institucional. En virtud de la literatura especializada han existido dos grandes enfoques que caracterizaron la temática de la calidad en la Educación Superior en las últimas décadas. Desde una perspectiva administrativa, la apuesta fue por la gestión de calidad, y desde los estudios sociales fue la promoción de la cultura institucional. En este marco, el estudio buscó caracterizar los referentes de la calidad subyacentes en los modelos de evaluación de los institutos superiores tecnológicos en el Ecuador desde el 2010 al 2020, para visibilizar la necesidad de replantear las políticas públicas desde el Estado y fortalecer la agencia de los institutos. Para alcanzar este objetivo se utilizó el instrumental teórico del análisis de las políticas a través de una revisión de información documental que permitió reinterpretar el concepto de la calidad. Finalmente, a modo de conclusión, el estudio determinó que el concepto de calidad preponderante en los modelos de evaluación de los IST se ajustó a la adquisición de altos niveles de excelencia y no incluyó la discusión de la naturaleza de la formación técnica y tecnológica relativa con la transformación de las capacidades de los y las estudiantes.

Palabras clave

Calidad, educación, institutos, tecnológicos, modelos, evaluación, política.

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Introduction

Quality in higher technology education has characterized more by the training of students' abilities than by levels achieved exclusively in accountability or institutional management. The claim is irreverent with the worldwide standardized proposal that Higher Education Institutions are ranked in terms of quality by criteria of efficiency and free market. As mentioned by Boni and Gasper (2011) quality in recent decades has "focused on competitiveness and efficiency" (p. 94).

Two major programs are developed in higher education worldwide. A university program that lasts from five to six years and is carried out in universities, and short programs that offer degrees from two to three years performed in technological institutes. The World Bank (2021), in its study on short higher education programs, identifies a variety of country-specific designations, for example "technical and technological programs, technical careers, technical higher education courses, technological courses, technical-professional courses, professional careers, and technology higher education courses" (p.1). In this context, the empirical object of this article is the short higher education programs, which in Ecuador is called Technical and Technological Training. Analyses of the quality of higher education in most countries and especially in Ecuador focus on universities as a field of analysis and as the central spaces in knowledge management in society.

Technological institutes are a key element in the management of knowledge and innovation. The abandonment of quality reflection in

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higher technological education is mainly evidenced by being new institutions. For example, when reviewing the reports of the international seminars held in 2008 by the National Secretariat of Planning and Development to address the transformation of higher education in Ecuador, they refer exclusively to universities or polytechnical schools (SENPLADES, 2009). In addition, the Quality Assurance Council (CACES) held the Second International Forum on Quality Assurance in Higher Education between November 29 and 30, 2017 in Quito, in which representatives of universities, polytechnics and higher institutes participated; however, in the publication that contains 14 academic articles, none directly addresses the problem of the nature of quality in technical and technological training (Cerbino et al., 2019). The authors argue that the scant reflection on the importance of technical and technological training is related to the structure of public policy on vocational training.

In line with this research, two research projects carried out in Ecuador stand out. The first conducted by Aguilar and Heredia (2019) addressed from the philosophical perspective the entry of business logic into the management of universities through the rhetoric of quality. From philosophy they recover the sense of quality from an Aristotelian position as quality. Quality education "must guarantee work, free action, as well as the expansion of vital forces and the integral formation of a project of human well-being" (p. 84). The other paper carried out by Gómez et al. (2017) addressed the learning and implications of the institutional evaluation process of the higher technological institutes. They define quality as an element "inherent and closely linked to the context and scenarios in which HEI exists" (p. 60). Specifically, the principle of the Ecuadorian system of higher education is to be the basis for the integral development of the country, through the production, dissemination, and application of new knowledge. From this perspective, the higher technological institutes are obliged to contribute to the achievement of this end by implementing a relevant and quality educational proposal. Relevance must be understood from its social dimension, strengthening its social link through research and production of new knowledge for innovation and sustainability, overcoming the traditional conception that technical and technological education is to meet exclusively the requirements of the world of work and production. On the other hand, quality must be seen from a multidimensional perspective, emphasizing the quality of learning and the transformation of the environment on the part of the students. In short, relevance and quality are two sides of the same coin. The problem that guides the research is the characterization of the ap-

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proaches that have determined the quality of higher technological education in Ecuador. In this context, the article proposes a characterization of the quality of technical and technological training based on the documents from the public policy on external evaluation.

The article was structured in the following sections. First, an analysis of public policy studies was made from a cognitive paradigm. Then, the main references of quality in higher education were reviewed. The following section presented the configuration of quality in higher education in the Latin American context. Subsequently, the institutional framework that characterized the dynamics of the technological institutes in Ecuador was addressed. In the last sections, work was done on the references that structured the quality evaluation models of the institutes.

Public policies from referents

The study of public policies involves identifying the underlying definitions of the State and society of these policies in their design and implementation process. Reinoso (2014) in an analysis of public policies distinguishes three macro-approaches to understand the complex research and variables in this field. In a socio-central approach, relations between the State and society are determined by social classes, social structure, or interest groups (Poulantzas, 2001; Dahl, 2008). In a state-centric approach, the State has autonomous power in its relationship with society to determine the design and course of policy implementation (Mann, 1997; Skocpol, 2011 [1989]). Finally, a relational approach characterized by a state both as an actor and a place in close articulation with society (Hall, 1993; Evans, 1996; Repetto, 2000). The research captures a relational perspective in the sense that policies are agreements generated between state and social actors. The course of the configurative character of a policy is best observed in a long historical journey.

According to Pressman and Wildavsky (1998), policy implementation processes should be seen as a constant process of redefining objectives, content, actors, and resources. The analysis of public policies is intended to understand actors, values, and interests that, despite the agreements formally established in the design of the implementation process, many of the actors differ in their patterns of action and in the ways in which resources are used. In other words, Majone and Wildavsky (1998) identify a double process, the design configures the policies but not in their entirety. Policies are continuously transformed by implementation operations. They indicate that implementation does not configure all policies either, even though policies can take great forms during the

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deployment process, but policy outcomes would not be separated from the original ideas, either. Fontaine (2015) in his book *Analysis of Public Policies: Concepts, Theories and Methods* argues that cognitive approaches are among the analytical approaches. In our research this approach helps to understand the social constructions, perceptions and values that explain the behavior of state or social actors in the policy implementation process. Yves Surel (2008) in his study on policies as paradigms distinguishes four elements that make up the cognitive universe: General metaphysical principles, hypotheses, methodologies, and instruments, i.e., a paradigm contains a set of social representations legitimized by its actors, who see in them their reference, but also their framework of action. The second element, concerning hypotheses and laws, relates to the rules of action that guide the actions of the actors. A third element is the methodology that establishes a form of relationship between state and social actors in the creation of policies. Finally, every paradigm includes "a conglomeration of cognitive and practical elements that structure the activity of a system of actors that make it coherent and durable" (p. 52).

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Another concept used to define the construct of values and representations is the referential. According to Muller (2010), public policy is a representation of the reality on which one wants to intervene. The set of images that structure the framework of action of the actors that confronts the solutions and defines the proposals for action is called referential. In other words, the referential would be defined as an image of the social reality constructed by the actors in a political relationship that produces tangible effects. The research uses the theoretical and methodological tools of the cognitive approach to explain the referents that determine the quality, problematization, norms, methodology and instruments of a higher technological institution. This effort is a new path in the studies of higher education policies in Latin America and specifically in Ecuador. According to Perrotta (2019) in his challenge of generating a Latin American quality assurance system, he argues that a technical rhetoric of accreditation and institutional evaluation of higher education institutions has been established in the last decades in Latin America from a perspective of suspicion and distrust about the State as responsible for providing public education or coordinating the system.

Quality referents in higher education

The problem is to characterize quality referents in higher education in general and particularly in higher technological education. The proposal

of the researchers before carrying out the documentary analysis of the evaluation models implemented in the institutes is to briefly review the approaches that have nuanced the debate on quality in higher education. Characterizing quality in higher education is a complex task, as Skolnik (2010) states that efforts to ensure quality must cease to be seen as a strictly technical process and should be best viewed as a political process. The political character of quality is not seen exclusively by the coexistence of various actors but by the positional character of the actors that determine the various ways of interpreting quality. Regarding the political configuration of quality, Plá (2019) says that it should be understood as a set of principles, norms, methods and instruments not so much to guarantee social justice but to "the production of inequalities that distribute social goods on the basis of individual merits" (p. 20). This critical stance fits in with what Flores and Villarreal (2021) call the performance society in their research on the subjective transformations of the parallelogram of power in today's societies. This society "produces subjects of performance, i.e., entrepreneurs of themselves" (p. 196). In short, in quality it is necessary to recognize the political process of its configuration, but at the same time the prefigurative character in the management of the institutions so that they assume quality as an exclusive individual responsibility for both its merits and its failures.

In order to reduce the complexity of analysis and to enable an understanding of quality, analysis is divided into three approaches: Business, cultural and philosophical. The business approach helps to ensure that higher education institutions must be managed from the strategies and processes that companies have undertaken to remain competitive in the market, but at the same time they have ensured survival in the complexities of today's society. According to Hughey (1997) the question is raised about what can higher education learn from business and industry? The author's answer is found in the description of business strategies of higher education institutions such as technological innovation, quality management, emphasis on the client, the work of motivated teams, lifelong learning and fundamental adjustment to norms and ethics. The main elements of a company's management are customer satisfaction and profitability. Similarly, institutions of higher education are called to focus on students as clients and on efficiency.

Gutiérrez (2010) in his book *Quality and Productivity* makes a brief review of quality in business management. Quality as inspection, statistical quality control, quality assurance, total quality and systematic improvement. In a first phase the concern was to increase inspection lev-

els under standards. The review was conducted in 100% of the products to guarantee that the products met the attributes required by the customer. A second phase, as Gutiérrez (2010) argues through Walter Shewhart's contributions, helped to the scientific basis of quality, and regarding the statistical application, the inspection of the products was carried out to samples and not to all the products. Deming (1900-1993) as a disciple of Shewhart applied the principles of administration such as planning, doing, checking and acting (PHVA cycle) to Japanese companies, and observed improvements in their processes. This approach addresses process improvement rather than product or output improvement. In a third phase, quality was viewed from an economic cost point of view. In other words, a product of poor quality has high costs and therefore a collective responsibility for quality needs to be set up. In order to generate commitment to quality, lifelong learning and strong motivational processes are necessary. In a fourth phase, total quality emerged as a proposal to ensure quality and standardize quality systems, with this objective the ISO-9000 standards were created. These standards articulated the spaces to consolidate a global movement to generate a quality management system. Finally, quality became a strategic issue, a competitive advantage, and a big business. In this context, organizations were seen as systems that integrated several interdependent components and processes. Within this framework, the management of an organization focused on improving the performance of the processes of each of its components. In summary, efforts from the quality management approach have generated the greatest impact on the administration of Higher Education Institutions. It would be unthinkable for higher education institutions to be managed without mechanisms and procedures to ensure quality, such as information systems, control reports of the implementation degree of planning.

On the other hand, a second approach to quality assurance aims to generate cultural changes from the direction of members of the educational community. According to Reinoso-Avecillas (2015), culture cannot be reduced to a "fact made, but to the way in which it is carried out as a criticism of objectivist positions that ignore the action and the actor and subjectivists for overshadowing the impact of structures on the day-to-day interrelationships of actors" (p. 68). While the management approach opted for improvement strategies focused on results and client satisfaction, the commitment to the culture of quality implies a relevance of the actors in the transformation of the institution. As Yorke (2000) argues, improving the quality of a higher education institution is not focused on product inspection and customer satisfaction, but on the

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outcome of an institutional learning process. This approach focuses its analysis on the role of academics in leading the task of developing a culture of quality. Yorke (2000) proposes some guidelines for strengthening institutional learning, such as: the development of a collective vision and strategy, the establishment of a sense of urgency in quality, the creation of a competent team to guide the work of the institution, the increase in mechanisms and levels of direct communication between the actors of the institution to guide the efforts in change, the shared commitment to the development of actions developed in the framework of creativity and innovation and not of mere obligation, and finally, celebration of the quality project components.

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The quality culture approach makes some criticism of the management model focused on quality management. First, the management model generated its interventions, mechanisms and policies from the business and industrial sectors, but the realm of academia is not limited to the mere application of processes that produce products in accordance with social needs. Institutions of higher education are focused on addressing student transformation processes and abilities. Second, the management model is based on a suspicious approach that not all higher education institutions generate good quality education, nor does it produce the requirements of clients. In this context, as Yorke (2000) argues, quality must be seen as moral commitment, a necessary condition for managing higher education institutions. In a 2014 manifesto of higher education academics from Ecuador led by Arturo Roig (2014) on evaluation models, they say that quality should integrate "relevance to society, participation, co-government and democratic administration of institutions, such as the democratization of knowledge and the building of social capacities for civic coexistence among critical people" (p. 4). In addition, management models bet on compliance with requirements and a homogenization not only of quality practices but also of the senses. For example, in a study by Hernández-Guitrón et al., 2018) on the implementation of 21 quality systems at the Autonomous University of Baja California in Mexico, it was determined that 17 systems were certified under ISO Standard 9001:2008, but paradoxically "only in two cases processes related to teaching and research are included" (p. 103). This means the confusion between accreditation and quality. On the one hand, Roig (2014) argues that accreditation "is a process that presents the minimum standards that a university must meet to be considered a university" (p. 4). These indicators can be reduced to a checklist by the government bodies established by law, but quality requires a commitment from academ-

ics, it is the result of a deliberate process, collective discussion of the relevance and active participation of the actors. Finally, as Han (2017) said "The society of the 21st century is no longer disciplinary, but a society of performance. Nor are its inhabitants already called subjects of obedience, but subjects of performance. These subjects are entrepreneurs of themselves" (p. 25).

Finally, from a philosophical analysis, the authors maintain that the educational quality is present in the discourses of the rulers, in the different norms and languages of the agents that make up the educational institutions; nevertheless, they maintain their polysemic and multidimensional character. According to the studies conducted by Harvey and Green (1993) and Harvey (1998), five versions of quality were identified: (a) quality as an exceptional condition, i.e. as exclusive to certain institutions or as exceeding certain standards; (b) quality as perfection or consistency that refers to the reduction of the probability of defects until their elimination; c) quality as a fit for purpose, where educational services are measured by customer satisfaction; d) quality as the delivery of value for money that refers to the efficiency in the use of economic resources; e) quality as transformation that refers to the continuous process of student transformation. In this framework, the four versions are reduced to a managerial approach to quality, and as will later be observed, it determines the hegemonic discourse of quality in higher education. The article is committed to restoring quality as an element that reflects the nature of higher education institutions and where we should focus. In this context, the focus is on the learning of students, the development of their abilities and their commitment to the transformation of the environment.

The theoretical postures of educational quality at the higher level are at the table of the debate, but in Latin America and Ecuador it is the states and governments that have defined the quality of managerial logic to exercise political control. A series of procedures and mechanisms arise from this conception to look for quality assurance and evaluation. Quality is closely linked to excellence, a category traditionally accepted as inherent in higher education.

According to Harvey (1998), the concept of quality from a dialectical transformative approach must overcome excellence, good value for money and the suitability for an objective. Educational quality cannot be reduced to compliance with external parameters or standards, hence the emphasis on the purpose of higher education, which consists in transforming the life experience of students through their improvement and empowerment. Only by looking at this educational purpose will quality

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become a strategy and not an end. Regarding the variety of notions of quality, teachers, students, managers, and other actors must take a position that is not exactly homogeneous, rather, it is aimed at restructuring the models of quality management and problematizing the principles of the socio-political aspect that sustained a culture of quality.

In order to conceive educational quality as a process involving several internal actors, Elken and Stentaker (2018) propose the notion of "quality work", where "the notion of quality is much more dynamic and is the result of the coordination and communication of the actors within the specific institutional context" (p. 9). Educational institutions legally conceived as democratic and emancipatory spaces are governed under hierarchical and limited managerial logics, where values, beliefs and multiple interests of all their agents come into play. Pragmatism is one of the essential characteristics of quality work, but it is not reductionist or alienating, rather it interrelates academic ideals, values and standards with all the instrumental processes of quality management. From this perspective, quality is built with and from its actors and seeks the reason of its actions rather than the simple compliance with regulations and standards imposed by external entities.

The configuration of educational quality in Latin America

Plá (2019), in one of his works on educational quality, masterfully summarizes the contribution of the two authors considered the pioneer in educational quality, those who established conceptual guidelines that were later assumed by public and private bodies throughout the planet. First, the New Zealand philosopher and pedagogue Clarence E. Beeby, who published his book *The quality of education in developing Countries* in 1966. In this work, Beeby conceived education as a policy that was present in all human activities, as well as in institutional structures, with the mission of opening possibilities for cultivating people's capacities. In this work, Beeby established the levels of educational quality: the classroom, the relation of education with the economic development of the community and social criteria. Another technical pillar in the expansion of the concept of educational quality is the American Philip H. Coombs, who published a book entitled *World Crisis of Education* in 1968. In this book Coombs 1986 [1968] described the critical state of education through a diagnosis and proposed the lines for future educational policies at the global level. According to his proposal, specialists must overcome five challenges: a) the modernization of the teaching administration; b) the

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modernization of the teaching staff; c) the modernization of the educational process; d) the modernization of the strengthening of educational finances; and e) the emphasis on informal education.

The ideas of these two thinkers, called by many critics as functionalists of the stage of educational planning and development, will be present in Latin America and the Caribbean and will influence the design of educational policies in technical education. From these proposals, the paradigm of educational quality has been created with the conditional support of multilateral financing organizations such as the World Bank and the United Nations Educational, Scientific and Cultural Organization (UNESCO). These entities complement each other in their visions and have developed articulating actions to contribute to the achievement of educational quality through two paradigms: Equity and inclusion. At the Regional Conference on Higher Education held in Cuba in 1996, prior to the World Meeting, it was recognized that development, democracy, and peace go hand in hand and assumed sustainable human development as a paradigm. This conference also established regional trends in higher education, among which were highlighted the persistent inequality despite the expansion of enrollment, a restriction on state investment in this sector, the multiplication and diversification of entities that offer tertiary technical education and the growing offer of private education.

Tünnermann (2010) analyzed the challenges of Higher Education in a series of conferences around the world, which were discussed deeply at the World Conference in Paris in 1998. The agreements established at this meeting were evaluated periodically and in 2008, in the Declaration of the Regional Conference on Higher Education in Latin America and the Caribbean held in Colombia, emphasis was placed on the creative and sustainable articulation of public education policies in higher education that reinforce their social commitment, quality, relevance and autonomy.

Through strategic alliances with UNESCO and other so-called multilateral agencies, the World Bank became one of the essential actors in discussing economic development and its impact on the formulation and implementation of public policies in the educational and other social areas, especially in our region. Domenech (2007) says that one of the bases for understanding the paradigms of higher education and technical education in Latin America and the Caribbean is to review the effects of the structural adjustment application that was dictated by the Washington Consensus and Post-Consensus at the end of the twentieth century. The proposals of global financial institutions were based on strong criticism of the welfare state. The main criticisms were the high level of

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inefficiency, bureaucratization, and centralism; likewise, education systems were seen as inefficient, ineffective, and unproductive. Therefore, the project proposed by the World Bank involved the reduction of the state and the expansion of the market; in education, the emphasis was on decentralization and privatization.

Thus, it can be inferred that there are two predominant paradigms in the formulation and execution of educational policies, specially at the higher technical level. Tünnermann (2010) reflects and presents these paradigms, first a humanist paradigm with emphasis on relevance. This model is evidenced in its programs aimed at meeting the sustainable development goals approved by the United Nations in 2015. This paradigm is also observed in the principles established by the World Conference on Higher Education in 1998, as well as the emphasis on responsible and academic autonomy of these institutions to contribute to the creation of a culture of peace, based on development with equity, justice, respect for human rights, solidarity, and democracy. On the other hand, there is the economistic paradigm whose primary agent is the World Bank, an organization that, taking advantage of its capacity and economic power, has become the main financing source for educational programs, but also its support extends to the fields of advice and research. According to Domenech's (2007), the World Bank:

> Education is essential to economic growth and poverty reduction, as it enables human capital to be raised through quality and outreach investments specifically targeted at the poor, but also through the systemic reforms needed to provide sustained benefits (p. 12).

Since the 1960s, the United States has strengthened its intervention in Latin America, supported by the Organization of American States, and the Inter-American Development Bank has implemented the Alliance for Progress. Arias (2009) noted that the development strategy assumed that states and governments adapted their structures, laws and systems to the technical recommendations of international organizations. Moreover, the economic credits granted by the great world power should be earmarked exclusively for infrastructure and to cover the basic needs of poor populations. A percentage of these credits were invested in education, mainly at the basic levels and in supplementary programs for populations in rural sectors. The educational quality was in the background because the aim was to massify a curriculum that contributes to maintaining order and security, the main postulate of this intervention.

To complement foreign intervention in the political, social, and cultural configuration, we must mention the establishment of military dictatorships, which were welcomed by the new world power and used repression and death to maintain order and security. In the case of Ecuador, Paz and Miño (2010) assured that both the military junta in the 1960s and the military dictatorship in the 1970s, while distancing themselves from these alienating and repressive pedagogies, contributed to the consolidation of the development model. Technical training education policies focused on specific technical schools were established because access to higher education was a privilege for certain people.

As mentioned by Arcos (2008), legal reforms in the educational field from 1950 to 1990 focused on access and expansion of enrollment, but from the 90 onwards, the reforms focus on quality with the support of funding agencies such as the World Bank and the Inter-American Development Bank, emphasizing inclusion and equity; however, the crisis, which worsened from 1996 to 2006, opaque all quality reform initiatives. The State that guaranteed the right to quality education became a problem and the privatization of education increased. However, starting in 2006, with Rafael Correa in presidency (2007-2017), education policies became a priority with the formulation of a new development plan and the adoption of a new constitution, and quality became one of the main principles guiding the new legal and structural reforms at all levels.

Institutional framework of higher technological training

Higher technological training has had different epistemological and teleological views linked to historical conditions which determined the quality criteria within the national education systems. This section describes the evaluation criteria of the evaluation models of the higher technical and technological institutes implemented in Ecuador in the last decade, as well as the actors and institutional framework of organizations that determined the guidelines for these models.

Higher technological training in Ecuador had several names: Craft training, technical education, and now higher technical and technological training (see figure 1).

Figure 1
Timeline for technical and technological training in Ecuador (1869-2020)
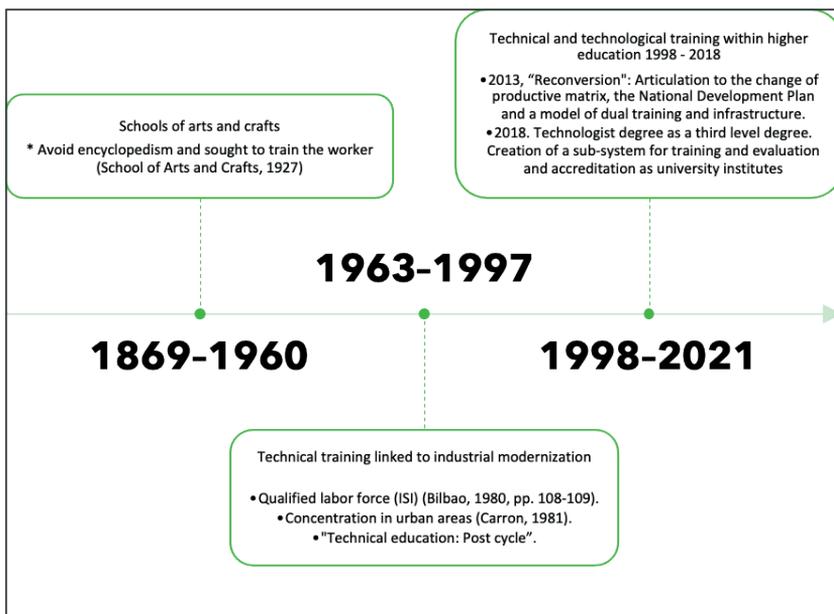
Tomaselli (2018) and Reinoso (2019) show that technical-professional training in the 20th century went through three phases related with the state configuration of each historical epoch. The first steps of technical-vocational training were found in the arts and crafts schools, created under the government of President García Moreno in 1869 under the name of Catholic Protectorate. This new institution contributed to the development of the emerging industrial sector. At the end of the 19th century the schools were run by religious orders (Presidencia de Ecuador, 1927, p. 1). The Salesian Congregation (1896) in the teaching program of the workshops determined that the aims were the promotion of religious education and the "technical, artistic or industrial instruction of young workers, mainly taken from the poor class" (p.1). In addition to the objectives focused on the teaching processes of a trade, the teaching program had the additional purpose of contributing to the interest and progress of the nation. The workshops offered degrees of teachers in art or craft in a period of five years. The final evaluation included requirements that the student must demonstrate, such as good behavior, the faculty to teach others for a period of five months, the works executed and a validation of knowledge (Congregación Salesiana, 1896). As for Mosquera and Reyes

(2011) since the middle of the 19th century many private and public entities in Latin America were forced to create schools of arts and crafts as synonymous of progress and social integration. As stated, the School of Arts and Crafts was in force until 1926, when it became part of the Faculty of Sciences of the Central University of Ecuador. In this same period another entity was created, the Technical Central, which in 1977 became the Superior Central Technical Institute and in 1996 was Higher Technological Institute. In addition, the creation of various technical educational institutions, among which the institutes of science, higher schools, polytechnics, recognized technical colleges, among others, were highlighted. According to Quishpe (2012), these institutions were created under the guidance of the State and religious orders, and all responded to the needs of practical and technical training, especially of poor young people who had to be integrated into work.

A second phase, the technical-professional training, was developed within the development approach of the Ecuadorian State. As Reinoso (2014) argues, between 1963-1981, a development era characterized by the role of the State in the design and implementation of the policies considered education as human capital for the economic development of the country. As mentioned by Bilbao (1980), the demand for skilled labor was aligned with development policies based on the Import Substitute Industrialization (ISI) model. According to Carron (1981), the concentration of the population in urban areas increased with the growth of the industrial sector. In the field of education, the Education and Culture Act was approved in 1977, and a two-year post-baccalaureate was created for the first time in three major branches: technical and technological, arts and pedagogy, from which the higher technical institutes, the institutes of the arts and the normal institutes emerged. In order to observe the effects on the organization of technological institutions, it is necessary to revise the Education Act of 1983, which established technical-professional training as a specialization dedicated to the training of technical and technological professionals. Technical colleges with specialization offered "degrees of practical, technical, or any other denomination in the respective specialization, which are different from the degrees offered by universities and polytechnical schools" (Art. 13). In other words, intermediate professional degrees were created between high school and third level degrees as engineers or graduates. However, between 1989 and 1998, the highest number of higher institutes originated were 117, while between 1979 and 1988 there were only 16 and between 1999 and 2007 only 51 (CEAACES, 2014).

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With the latter, we can argue that the system of technical education in Latin America originated in High schools, and different changes were made from the infrastructure and equipment to legal reforms from the Central State. This fact is seen in the commitment that the States made in 1990 to reform the curricula of their schools in order to eliminate the gaps in the development of skills.

Finally, a third phase originates with the insertion of technical training and technology in Higher Education. In the 1998 Constitution, they became part of the higher education system, under the supervision of the National Council for Higher Education (CONESUP). With the issuance of the Organic Law of Higher Education of 2000, CONESUP was ratified to create and suppress higher technological institutes; likewise, the Ministry of Education had the power to propose the creation of these public institutes. Thus, the law established that the institutes should be placed under the administrative and financial responsibility of the Ministry of Education and, academically, under the responsibility of CONESUP. It was also stated that technical careers would last two years and technological careers three years; the National Evaluation System was also established in order to guarantee educational quality and continuous improvement. Finally, with the Constitution of 2008, changes were made, which are still in force. On the one hand, the higher education system was linked to the National Development Plan, and as regards the creation of higher education institutions, it was subordinated to quality assurance and planning agencies; they also established a five-year period to evaluate all institutions of higher education. The reforms of the Higher Education Law in 2018, considered technical and technological degrees to be third level degrees. In short, the historical configuration of technical-professional training is evident as subalternative. Higher education was considered the training that students receive in the Universities and Polytechnic Schools. The aim beyond the scope of this article is to review the historical development of the regulations that favor or not the technical-professional training and the actors that mobilize within a specific political and social scenario.

With technological training as a higher education, it was intended that new professionals acquire analytical skills, knowledge development and the strengthening of critical thinking. As Perazzo (2017) indicates, there are not boundaries between technology and science in a knowledge society, characterizing technological training as

> (…) a) To train professionals to research and develop technologically in order to create, innovate, and adapt; b) To contribute to the moderniza-

tion and competitiveness of the productive system and to the social and cultural development of the nation; c) To implement new production technologies in the design and creation of new methodologies; d) To develop scientific technological capacity, and e) To generate intellectual capacities, with high levels of conceptualization, abstraction, logical reasoning and modeling of reality (p. 10).

In view of this scenario and based on the new legal framework that governs the country since the adoption of the 2008 Constitution, educational quality became essential to overcome the developmentalism and achieve the *sumak kausay* or good living. Despite this, the concept of educational quality seems to be related to the business vision, as stated by Vázquez (2015):

> Taking up the business practice that establishes the quality of a product or service through inspections and tests designed based on the standards of what the market expects, the quality of education was mechanically associated with the evaluation, understood to be not as part of the teaching-learning process, but as a measurement of results through standardized instruments (p. 9).

One of the relevant aspects contemplated by the Organic Law of Higher Education (LOES) (2010) in Ecuador is the evaluation and accreditation to achieve the desired educational quality. Regarding educational quality, Article 93 of the LOES notes: "The principle of quality consists in the constant and systematic search for excellence, relevance, optimal production, transmission of knowledge and development of thought through self-criticism, external criticism, and permanent improvement (art. 93). This Law is very clear when pointing out that quality must be evaluated to determine the status of institutions and their careers, through the collection and systematization of quantitative and qualitative data that give way to the diagnosis of components, functions and processes. This evaluation will be ongoing, i.e., all institutions must undergo an accreditation process, which corresponds to a quality certification after they have met international quality guidelines, standards and criteria.

On the basis of this Act, the Council of Higher Education (CES) and the Council for the Evaluation, Accreditation and Quality Assurance of Higher Education (CEAACES) were established as bodies governing the Higher Education System. Likewise, since the approval of the National Secretariat of Higher Education, Science, Technology and Innovation (SENESCYT), it was the governing body of public policy at the higher level and the entity responsible for the coordination between the Government

and higher education institutions. With this legal basis, all the processes to evaluate and evaluate universities and technical institutes were implemented and the results were not encouraging. According to Cortés and Villafuerte (2017), the results of the evaluation of 219 technical and technological institutes carried out between 2014 and 2016 determined that the quality of these entities is low because only 47 were certified. What is most striking is that out of the 47 evaluated institutions, 40 are private, six public and one co-financed. In addition, most certified institutes are in zones 8 and 9, in the largest cities of Guayaquil and Quito, and the most critical point is that the careers offered by these certified entities are linked to only three sectors (services, business administration and law), of the 14 prioritized by the State for the transformation of the productive matrix.

In addition to this evaluation and certification process in 2014, Fiszbein et al. (2018) assure that SENESCYT implemented the project for the conversion of Higher Technical and Technological Education in Ecuador, observing the goals of the National Development and Good Living Plan 2013-2017. This project aimed at expanding enrollment at the technical education level and at raising the level of enrollment in relation to university education; to achieve this end, the construction and physical and academic conversion of forty technical and technological institutes at the national level was done. These institutes should have a specialized approach in some of the areas identified as strategic in order to achieve the change in the productive matrix and a territorial approach, i.e., their careers had to respond to the needs of the human talent of that place or region where the institution was located. To conduct this plan, the State invested 308 million and managed financial support from the World Bank to reach 53 000 students by 2018.

SENESCYT, as the governing body of the public policy of higher education, endeavored to enforce legal mandates; for this reason, the forty technical and technological institutes mentioned above created new careers in accordance with the strategic sectors prioritized in the Development Plan; these careers were implemented under the dual modality. Espinoza (2020) says that the dual modality is not the mere combination of study and work or simply a preprofessional practice; in this case, the company becomes co-responsible for the training and academic instruction, contributing to the development of work skills in the student, through the manipulation and insertion in the productive processes. In December 2019, the pact for dual education was signed and the Plan of Education and Technical and Vocational Training was launched. In the same event, SENESCYT informed that 9895 students of technical and

technological level were registered, taking advantage of the 573 agreements signed between public and private institutes and enterprises.

According to Morales (2018), from 2011 to 2018 were evaluated "23 Higher Pedagogical Institutes, 5 Higher Intercultural Pedagogical Institutes, 15 Higher Institutes of Arts and Higher Conservatories, 221 Higher Technical and Technological Institutes, 5 Higher Technical and Technological Institutes with distance modality" (p. 3). SENESCYT reported that by December 2019, 238 technical and technological institutes were still legal: 98 are public and 140 are private, where 1132 careers are offered, of which 296 belong to public academic centers.

This evaluation process generated criticisms and was rejected by various sectors and actors of the higher education system by arguing that the models implemented to evaluate and certify institutions of higher education were results-focused rather than processes-focused and did not consider the reality and context of the institutions evaluated. Additionally, the purely regulatory and even punitive character aimed at achieving educational quality, but stagnated certification. In view of this scenario, the National Assembly considered reforming the Organic Law on Higher Education, arguing that the goal of higher education is quality assurance.

Among the most important reforms carried out to the LOES, Heredia (2018) highlighted the modification of some bodies, for example, CEAACES would be replaced by CACES and the categories of universities and the distinction of universities devoted to teaching and research would be eliminated. In addition, in this new Law, the educational and arts institutes are part of the institutions of technical and technological training; in the same way, the third level, the technical-technological and the fourth technical-technological level were established.

Quality assessment models of higher technological institutes

Rama (2015) says that the different systems of technical training in Latin American countries were characterized by informality and low quality, without academic rigor, and were extremely instrumentalist and argued that:

> Technical and technological training corresponded to training processes for low-wage jobs, which offered studies with strong practical components of technical level of 2 years or less, with low levels of regulation, quality control and public resources (p. 18).

However, Sevilla and Dutra (2016) argue that the best contributions of technical training are in countries that have generated a system

of higher technical and professional education parallel to the university, such as Colombia, Mexico, Brazil, Chile and Peru.

The analysis of this research focuses on the higher technological institutes. The choice of higher technological institutes as the subject of this article is based on two reasons. The first is substantive, where higher education studies have been linked with university studies. In other words, to speak of higher education is to speak of universities. In this context, theoretical reference helps us to have better capacities to understand the challenges of higher education in Ecuador and how to address the problems of the territories and the productive and social sector. The other is more operational with access to documentary sources of the evaluation processes of higher institutes.

Some conceptual clarifications are required before carrying out the study of the evaluation models implemented in the institutes in the last decade in Ecuador. Since the beginning of the evaluation processes in Ecuador, the concept of quality has been the structuring principle of the analysis processes of the technical and technological training system, i.e., the underlying meaning of quality is determined in some way by the criteria and indicators of the evaluation models. Follari (2019) explains that the evaluation processes, through their models, have established a certain hierarchy of the institutes and do not allow us to reflect on the possibility that each institution has to adjust its processes and move forward according to its structural conditions, territorial conditions and capacities. The definition of the quality of technical and technological institutes has been subservient in the theoretical discussion. The implementation of the evaluation models of the institutes was carried out after the evaluation of the universities. Finally, according to the National Council for the Evaluation and Accreditation of Higher Education of Ecuador (CONEA) in its report in 2009, the origin of private and public higher institutes is in secondary education, and this involved many institutions that had neither the conditions, nor the resources, and often not students.

The research focused on the evaluation models of the higher technological institutes to measure quality from 2008 to 2021. The models, criteria, emphasis, and institutions that govern it will be characterized in this framework.

Evaluation model of the Higher Institutes CONEA 2007. The first institutional evaluation of the technological institutes started in 2007 by CONEA. The evaluation process had two phases: The first was a self-evaluation process and a second phase consisted of the verification of information under a model, which was conceptualized as systemic and integrated four functions:

Teaching, Research, Community Link and Administrative Management. Eight areas were identified from the functions. In total, 96 standards were configured. The standards were defined by CONEA (2007) as qualitative and measurable elements that objectively express the desirable level against which the indicators are contrasted. However, the participation of the institutes was voluntary and out of the 270 registered only 15 were incorporated into the self-assessment phase and only one completed the process.

Assessment model of the 14 mandates of the Technological Institutes. The National Constituent Assembly (2008) on July 22, 2008, through the mandate 14, decided "to determine the academic and legal situation of all educational institutions under its control on the basis of compliance with its provisions and the norms that are in force in the country in terms of higher education". It created a definition of an evaluating state (Krotsch, 1995; Rama, 2005) or recently of a certification state (Solanas, 2019). Since 2008, the State assumed an important role in the management and direction of higher education institutions. This was centralized and focused on the management of public institutes by the Executive Secretariat of Higher Education. CONEA (2009) was responsible for the development of the final report. The criteria used for evaluating higher education institutions in 2008 were: academy, students, research and management. However, only three criteria were considered for the technological institutes: teaching, students and administration. Some characteristics of this process were supported by the political agenda of the government and sought to consolidate a perspective of an evaluating State (Rama, 2005; Krotsch, 1995), but also sought to align higher education institutions with the development objectives of Ecuadorian society.

The evaluation model used by CONEA (2009) was multi-criteria to assess quality as a multidimensional concept.

> This multi-criterion decision theory in the performance evaluation of HEI (…) sought to ensure acceptable consistency levels of analysis with the help of consistency control tools and techniques; and on the other hand, transparency in the evaluation process, ensuring clarity in the assumptions of the analysis method in the interpretation of the information and was multi-criteria in the formulation of conclusions (p. 7).

In order to identify the quality approach used in this evaluation model, it is necessary to review the quality concept presented by CONEA in 2003. Quality is:

> Set of factors that affect vocational training, the way of knowledge production, the construction of moral and ethical values and their social

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dissemination, based on the achievement of objectives and goals set forth in the vision, mission and institutional plan (p. 7).

The quality of higher education would be identified by factors or criteria and each criterion would have indicators or standards. As CONEA established in its 2009 report, the criterion is a model that allows establishing preferential relationships between the objects of evaluation or alternatives. Indeed, the criteria will determine whether or not certain relationships should be prioritized by the institutes. Although this research model implemented by CONEA did not aim at institutional certification but rather to diagnose the academic performance and legal status of the higher institutes, in one way or another it cataloged the evaluated institutions with a certain quality.

The structuring of institutes of the research model of CONEA focused on assessing performance according to criteria. However, it allowed the evaluation to be closer to the reality of the institutes. The evaluation divided the institutes into industrial, agricultural, administrative, pedagogic, conservatories and arts. Additionally, it allowed to generate comparison processes between the institutes and to orient them to find their references in others of the national level. This research model of the academic situation of the institutes prioritized the resources and the conditions that an institution has to offer technical and technological training processes.

Evaluation model of the learning environment of CEACCES Higher Technical and Technological Institutes 2014. The 2014 model was built by CEAACES (2015) and collected several elements of the 14-mandate evaluation model. First, the assessment of institutes was understood as a vaguely structured problem and therefore required a multi-criterion decision method. Second, the model was conceived of an arborescent type, i.e., that lower hierarchical levels can be seen as a means of reaching a higher hierarchical level. This model established five criteria: Relevance, Curriculum, Quality of Teaching, Infrastructure and Institutional Environment. In addition, it set up a total of 50 indicators, of which 34 were quantitative and 16 qualitative. Hence, being more important the quantitative indicators, we can define that quality assessment focused on reviewing the resources and basic conditions that a technological institute should have to offer the quality of higher education. This evaluation process, unlike the previous one, established a ranking of institutions due to their performance. As results, private institutes have better performance levels than public institutes.

This evaluation model of institutes is framed and supported in the Organic Law of Higher Education (LOES) of 2010. The definition

of quality as the search for excellence established a condition for ranking institutions. In this sense, quality was conceived as an exclusive principle of certain institutions while most did not achieve optimal performances. In this sense, the administrative vision of quality contradicts the perception that institutes should implant. The notion of principles implies that all institutions must ensure quality.

The principle of quality has other characteristics with the reform to the LOES in 2018, in art. 93. The first is the collective search for a culture of quality. This search is not only an individual effort by the institutions but is a responsibility of the higher education system. Additionally, another characteristic is the balance between the substantive functions, and it uses relevance and inclusion as referents of quality, among other principles.

In this context, it is evident that the evaluation model of higher institutes in the evaluation process of 2020, promoted by the Council for Quality Assurance of Higher Education, sought to reorganize, and conform to the reforms of the LOES. This restructuring involved moving from five to six criteria: organization, teaching, research, relation with society, resources and infrastructure and students. These criteria look for a more qualitative approach and for identifying the processes of the institutes to determine their level of performance. Out of the 32 indicators, 21 are qualitative and 11 are quantitative.

Challenges for technical and technological training in Ecuador

Superior technological training has had several challenges. First, its valuative character, conceptualized as training for work, but the social conditions of finding a job are increasingly complex in societies such as Latin American with poor productive sectors and fragile democracies. This challenge included setting up higher education systems where technical training is included and is related to the innovation processes of the productive sector and contributes directly to development objectives. Another of the challenges is political, where the responsibility of the States must be in relation to the configuration of a quality vocational training system. This involved guaranteeing infrastructure, laboratories, and workshops, establishing a professional career of teachers and consolidating territorial innovation systems. The challenges also include the academic field. Teaching and learning activities cannot be reduced to institutional classrooms but must be extended to real work scenarios. An educational process is required that prioritizes practical action and the application of knowledge, accompanying the development of quality

learning. This challenge implies the cooperation between the business, social, productive and academic sectors.

Conclusion

Quality is a category that is fully adjusted to the productive field and is associated with products with certain characteristics; however, this category was included in education and the States were adapting policies in order to respond to the new complex needs of society. Decisions in pursuit educational quality were nuanced and conditioned by different actors and interests, limiting government entities to the exercise of their regulatory power.

In the course of the evaluation models of the higher technological institutes, one of the relevant findings is the concept of quality suited exclusively to the acquisition of high levels of excellence. In other words, the evaluation models of the higher institutes have adjusted quality to the efficiency and effectiveness of the institutional processes. However, they did not consider that the construction of quality is not only responsibility of the institution but a collective responsibility of the higher education system. In this context, quality is not only a result of the processes but also a structural condition of higher education institutions. In order to achieve quality, the traditional purely administrative vision must be eliminated, and a vision of quality aligned with relevance, inclusion and diversity must be implemented.

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