

RELATIONSHIP BETWEEN HIGHER EDUCATION AND THE DEMANDS OF THE LABOR MARKET

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Abstract

In a social context, in which immediate actions are demanded from higher education that contribute to improving the living conditions of the population, but with an academy that barely responds to the needs of the population, intentionally isolating itself from reality, it is necessary make a substantial effort to evaluate the relationship between higher education and the demands of the labor market, trying to decipher in this way what has been the contribution of ESPOCH, as an institution of higher education, to productive development in an environment that, due to its sociopolitical situation, is highly conflictive. For this, a research with a qualitative, descriptive and correlational approach was proposed, an open survey was applied, via online, to which 89 graduates from seven faculties responded, the instrument was validated with Crombach's Alpha. The data obtained was correlated using the Chi square statistic, based on several indicators, such as gender, the faculty of origin of the graduates, the time of graduation, the time of existence of the business, the affinity of the business with the career, the way in which the entrepreneurship was carried out, the support of the professional title and the generation of employment. In general, it was possible to establish that there is no statistically significant correlation between aspects related to academic training and the labor market. It was also concluded that the evaluation of graduates is carried out in compliance with a formalism and that a real commitment is required from the academy with its graduates to promote a productive development process in which real synergies are generated between the most emerging needs of the population and the educational scope of higher education.

Keywords: Higher Education, Labor Market Demand, Follow-up of Graduates, Population Needs

INTRODUCTION

The demands of the labor market require a higher education committed to the productive reality of society, for this the skills acquired at the university must be linked with the learning of professional practice at work.

From the initiatives to renew university education in Ecuador, research has grown aimed at studying the problems of the relationship between higher education and the world of work, seeking the links between the skills acquired by graduates, at different levels of preparation, with the conditions that contribute to the creation of an optimal model that combines educational and professional standards(Castrillon, 2018).



The reason is the obvious gap between the supply of the higher education system and the demands of the labor market, a situation that has its primary cause in which a university graduate, by the fact of having received a higher education, is not a specialist, becomes such with practice, and this takes some time, thus, the initial reason for the appearance of this imbalance is objective and practically irremediable (Vera & Coral, 2017) (de Gottifred et al. , 2018) .

It is similar to the problem underlying the differences between school and secondary education with respect to higher education. The objectives of education at the school and middle level differ significantly from those of the university, which determines the specificity of the behavioral stereotypes of the systems that represent them. In addition, the educational environments in which they plan to achieve these goals also have significantly different characteristics (Erreyes et al. , 2017)

The problem of linking higher education and the world of work is of particular importance for two reasons, first, it arises as a result of differences in the conditions in which the training of qualified people takes place (Ruiz et al. , 2018) . The second is of an artificial nature, its appearance is due to terminological "inconsistencies" in the descriptions of the requirements for qualifications in education and for professional qualifications, hence it is important to explain several aspects of the "linkage" of higher education and the world of work, identifying the essential nature of the differences between the characteristics of competences generated in educational processes and competences acquired in professional practice, and determine professional standards in solving these problems (Triviño et al., 2019). Naturally, a number of difficulties arise when trying to resolve these differences when considering that the description of the standard of learning level provided by higher education does not fully correspond to the criteria of competencies required of a specialist to fulfill certain job functions. (Bernate & Guativa, 2020)

Levels of interrelationship between higher education and the world of work

In order to understand how to compensate higher education with the labor requirements of society, a complex hierarchical structure has been visualized, in which the objectives of higher education have been transformed to become contradictory to what should be expected of their condition. Its components are: 1) alienation of professional and educational standards, 2) alienation of the competencies of graduates and generalized job functions of working specialists, 3) alienation of the professional qualification and qualification of higher education graduates, as well as 4) alienation of the system of independent evaluation of qualifications and the system of independent evaluation of educational programs. The aspects of the interrelations between higher education and the world of work will be discussed below (Gonzalo et al. , 2017) .

Improving the quality of specialist training and strengthening the effectiveness of educational programmes is the main objective of the development and introduction of professional standards. At the same time, the structure of the curricular programs is focused on achieving the quality and maximum efficiency of the work of a professional in the fulfillment of his functions (Barraza, 2018) (Diaz et al. , 2020) .

However, Ecuadorian universities are increasingly confronted with a social phenomenon that considerably affects the life of the country: "unemployment" among graduates (Bustamante et al. , 2020) The effect is the alienation of professional and educational standards, which is mainly a problem for educational organizations. Meanwhile, the development of professional standards is supervised by the Ministry of Labour or by the participation of representatives of large employers, particularly industrialists and entrepreneurs. Therefore, employer representatives must be increasingly involved in bridging divergences between curriculum structure and job requirements (Hernández et al. , 2021) .

Professional standards are constructed in the context of specific job functions and job responsibilities, each of which is associated with a given set of competencies. The job function involves some professional actions, for the performance of which the employee must have the required knowledge and skills. However, the Ecuadorian Labour Code does not refer to a



professional standard as a characteristic of the qualifications necessary for an employee to carry out professional activities of a certain type, including to perform a specific job function. (2015)

This implies a very important conclusion that the list of possible job responsibilities of an employee does not consider the concept of "qualification" and, therefore, is not included in the characteristics of qualifications, that is, in the professional standard. Therefore, in current practice, there are no legal grounds for the application of a professional standard when the employer determines the employment obligations of employees. Moreover, as noted above, professional standards do not correspond to the definition of an employee's qualifications in the Labour Code. Work should therefore be done on the issue of making changes to professional standards, including with a view to significantly revising their content (in particular, taking into account the task of matching the requirements of professional standards with educational standards). (Bernate & Guativa, 2020)

Particularly sensitive is the problem of the interconnection of the educational standard that universities manage at the undergraduate level with the professional standards required by society (Gonzalo et al. , 2017) . Higher education at this level is an instrument of a medium-term strategy for staff training. Therefore, higher education at undergraduate level should have no more to be professionally oriented. At the same time, taking into account the "profile" of this type of programs and the need to hire their graduates, there is an urgent need to quickly reorient the education system with a vocational complementarity, strengthening them through the integration of strategies for the development of additional professional competencies in the final stage of the curriculum. In this way, students will have the opportunity, while still in the classroom, to complete a basic educational program of higher education, to receive, in addition to an academic degree, an additional professional qualification, which responds to the immediate needs of the labor market (Maggi & Paredes, 2017).

In order to improve the interrelations between higher education and the world of work, it is necessary for the potential employer to see in universities the opportunity to find staff with the required qualifications. Therefore, professional standards should be designed on the basis of standardized principles (Ruiz et al. , 2018) .

The basis of professional standards should be based on qualification requirements for the employee, in the form of knowledge, skills and competencies, classified by (Vera & Coral, 2017)s-levels. And then, the professional standard could be considered as a normative document that determines the level of qualification of an employee, allowing him to perform professional duties according to the requirements of a particular job. A prerequisite for a constructive solution to the problem of combining professional and educational standards is the "link" of the competencies of the graduate and the generalized job functions of the specialist in a given job. This topic is discussed in the next section. (Orozco et al., 2020)

METHODOLOGY

The methodology used for this research has a qualitative approach, with a non-experimental design, the type of research was descriptive and correlational, taking into account that the situation of the graduates of the Polytechnic School of Chimborazo (ESPOCH) was analyzed, for this purpose an open survey was proposed, online, aimed at graduates, communicated through social networks and email to the graduates, especially to those who had completed their careers between 2006 and 2020, this call had a response from 89 graduates belonging to the following faculties: Faculty of Business Administration, Faculty of Livestock Engineering, Faculty of Computer Science and Electronics, Faculty of Sciences, Faculty of Natural Resources, Faculty of Mechanics and the Faculty of Public Health.

Prior to the application of the test, a survey instrument was considered, the questionnaire was constructed with 10 questions of general data and 18 questions on specific data of enterprises, a pilot test was applied, the results were subjected to a Crombach's alpha analysis of $P = 0.89 < 1$, which gave reliability of the questionnaire.



The survey was implemented online. The results obtained were organized and systematized in the SPSS version 26 software. An analysis of descriptive statistics was carried out to determine the current situation of businesses undertaken by the graduates. The questions related to determining the gender of the entrepreneurs, the faculties of origin of the graduates, the time of graduates, the time of existence of the business, the affinity of the business to the career, the way in which the entrepreneurship was carried out, the level of support of the degree in relation to the formation of the business were considered. To understand the dynamics of the relationship of the university with individual ventures, the data were correlated, using the Chi-square statistic.

RESULTS

Generally, the combination of the competencies of a specialist with those of a graduate of the university are considered as one of the mechanisms to update educational standards based on professional standards. This argument, which may be a solution to the problem of linkage, would imply regulatory and legal changes in higher education systems.

At present the competence of an employee is interpreted as a combination of his professional qualities and the level of his qualifications, necessary for the successful solution of the work and office tasks he faces, the performance of high quality and free of errors in his work functions and coexistence with his co-workers both in ordinary and extreme situations.

It should be noted that, among employers, the availability of a worker's professional and social skills is considered paramount. However, the understanding of the definition of competences from the formative and labor point of view are different, since theoretical teachers are based on the principles of the processes of educational management, and are expressed through compliance with the contents of the curriculum, instead for employers, on the contrary, are generalized job functions.

Model for follow-up to graduates.

Background of follow-up model, for graduates

In 2008, the Escuela Superior Politécnica del Chimborazo (ESPOCH), reported the results of a follow-up to graduates as an enabling document for accreditation between 2002 and 2007. The information is obtained on the basis of a study carried out on 5,500 graduates in the last 6 academic years. The study takes a stratified random sample, however, the reported reports have shortcomings linked to the objectivity of the data, very dispersed treatment of the information and the sample does not represent the graduates by specialty, but rather in a general way (Brito, 2008). In 2011, the Equinoctial Technological University (UTE), monitors 19 graduates, in the area of psychology, the particularity of this initiative, is the adaptation they make for the acquisition of information through online forms, the problem is the low representativeness for the number of graduates from which the information is obtained (Morueta & Cedeño, 2015).

The Casa Grande University (UCG, 2011), reports a study that evaluates the satisfaction of the work skills of graduate professionals, against the requirements of employers, a study carried out in 2009 in three faculties, where two interesting instruments are structured, the first oriented to know the satisfaction of graduates, with respect to the training aspects that have served them in their work performance. And a second instrument aimed at employers with respect to the performance achieved by graduates, in what is called transversal competences.

This educational institution has developed a monitoring system, structured on the basis of a regulation, within the framework of the policies generated for the link with the community. This project articulates two important axes and information: an employment exchange, which provides permanent information on the requirements of employers, becoming an important database for the redesign of the curriculum offered.

Satisfaction surveys for graduates and employers have the function of complementing the information of the work count as indicators.

The employment exchange provides regular data on employers' annual offers, which constitutes a bank of indicators relevant to the design of employers.



Curricula. On the other hand, the satisfaction survey complements the indicators from the count of the labour supply.

At present, universities are considerably linked to computer systems to track graduates, with the purpose of facilitating logistics processes, information collection, ease for ordering, analysis and interpretation of data, in addition to this mechanism, 'presents alternatives of Feedback, i Integrating information services, employment exchange, the work that unions, groups, and technological information have been performing, and investing in virtual environments conducive to keeping open the links of the university with the graduates and integrating in a better way to the socio-productive fabric.

The National Polytechnic School has a graduate link, (EPN, 2022) which links to the EPN Alumni page, where scholarships, news, events, RSS channels and job boards are offered, from where, upon registration, it allows the graduate to consult job offers and apply. It also allows employers to obtain, on the other hand, it also allows employers to access a resume summary and personal data to hire professionals.

The Polytechnic School of the Coast, monitors graduates in some of its faculties, it is (ESPOL, 2022) not an activity that is done systematically, or in all faculties, however, it is a space that allows the promotion and dissemination of employment, job offers, scholarships, and spaces for specialization and continuous training.

The system that manages the ESPOCH of (2022) follow-up to graduates, is based on an employment exchange, accessing the Units of Insertion Laboral and Seguimiento, space in which has important interference the commission of linkage with the community, after a previous registration of graduates or company, a link leads to a series of surveys, this is a system scarcely disseminated and promoted, the effort made in the faculties is very specific, for example the last update of the job exchange on the website was made in October 2021, however the job offers appear more informally on the Facebook site of the Linking Directorate (ESPOCH, 2023).

The Pontifical Catholic University based in Quito is also linked to the alumni network Alumni PUCE, which enables access to a bag of supply and demand for employment, for this, it is necessary to register through forms, for the graduate to register and for the job offer.

The University of Azuay, through (UA, 2022) its website, offers multiple services, including access to job offers, through an open platform, which can be entered, employers, graduates and students, through a registration process, in which the resume can be integrated. The Universidad San Francisco de Quito, has developed a group for graduates, with direct link from the home page, (USFQ, 2022) offers several services, including records of academic data and resume, which have free access to employers, for which it is only necessary to register.

The Universidad Particular de Loja, on its website through the direct link Alumni, (UTPL, 2023) has proposed a program of help and follow-up to graduates, with a free employment exchange for graduates and employers. It also proposes special discounts on the professionalization offer.

Application and institutional requirements for the management model and follow-up to graduates.

The follow-up work remains to graduates of the education superior, constitute an important source of indicators, which enable the academic restructuring to promote an educational offer according to the needs of the socio-economic environments, this axis of research gives the university relevance, (Morueta & Cedeño, 2015) orienting it towards a better quality management, strengthens the quality of documents, research, extension and links with the community, providing information for:

Assess the quality of training, the capacity for labor insertion, and the level of performance, which the graduate can achieve in the work context, as well as

- a) To know the requirements of reinforcement and training, in spaces where the knowledge and competences acquired has not been broad enough to satisfy specific needs in the labor market.
- b) Evaluate, based on reality, changes in the labor market or specific occupational aspects, considering the specificity of the career offered.



- c) Understand the dynamics of linking a career based on the needs in the work context. Local, regional and even international.
- d) Know the quality of teaching performance and the planning and execution of systems of interactions in the teaching-learning process in research and extension.

In the ESPOCH, the follow-up work to graduates has been punctual, and has been carried out to comply with the evaluation requirements for accreditation, therefore, what is strictly necessary has been done to fulfill this purpose, this is general studies, carried out by faculties and specific careers, or analysis from the central administration and the department of linkage with the community. This means that no joint effort has been made from and for the academic units, which are the ones who get the most benefit from this task. In addition, because the proposals are isolated, the methodological proposals have been diverse, where the work of a team is bypassed by the new one, in a chain of beginnings that manages to achieve nothing concrete.

The graduate monitoring scheme presented below, is based on the analysis of previous work, in addition to the contribution of previous experiences, from other higher education institutions inside and outside the country, it is therefore intended to propose an intelligible, systemic, easy-to-use model that is capable of yielding results that contribute to the growth and development of the different schools, Faculties or academic units.

MODEL DESCRIPTION

GOAL PLANNING

The proposed model for the follow-up of graduates is based on the approach of objectives according to the interests and needs of the curricular, institutional, labor support and linkage with the community, so they are basically proposed to consolidate an operational organizational system and the different variables and long-term results of the organization working. In this sense, the objectives to be achieved would be the following:

- Know the academic process and labor integration of graduates, the motivations for access to the career, their performance in and during their academic life, complementary postgraduate studies, learning experiences and professional practice that have enriched their skills, the factors that have intervened in the achievement of work, the achievements achieved and the evolution of their professional career.
- Know the degree of satisfaction of students, perceived in their educational process at the university, in terms of services, infrastructure and specific elements according to their career, as well as the level of compliance and satisfaction of the services and benefits offered by the higher education institution.
- Know the requirements that the demand in the labor market requires of the professionals to hire according to the different specializations, as well as the work experiences that as professionals they have obtained in their jobs
- Know the requirements that have not been satisfied to the demand and the deficiencies that have been found in the supply of professionals.

SAMPLING METHOD

The study will require a sampling that integrates the population of graduates, from the last cohort until the maximum number of years that the specific career lasts, this is one of the factors with variability that must be considered to obtain the best results, the time of the medical career, is not the same as that of an engineering in business administration.

Although, in the graduation process, the necessary data is collected for the tracking of professional novices, generally these data vary with greater intensity as time passes. The labor requirements, or the search for opportunities make professionals change their place of residence, telephone numbers, mail, and other elements that allow their follow-up, this problem justifies a permanent follow-up, which attracts professionals to stay in permanent contact with the higher education center.



Consequently, to this problem, the planning carried out by those responsible for the follow-up, will seek to maximize representativeness through the sample of graduates, taking into account the number of graduates, the time elapsed since graduation, the level of interrelation maintained with the graduates, etc.

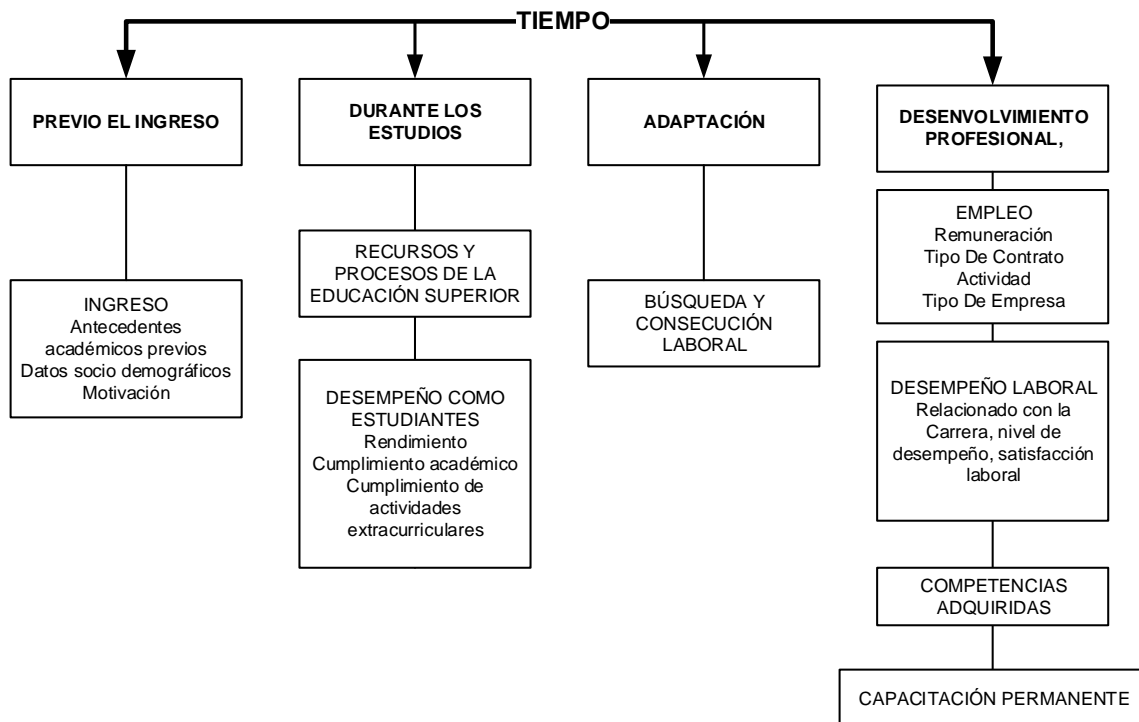
If the case gives the possibility, a stratified random sampling can be carried out, considering the total of the graduates of each cohort, in each specialization and the duration of studies to obtain the title. Considering these aspects, and others that merit the peculiarities of each specialization, a representative number will be obtained with an error variation of ± 5 .

TRACKING VARIABLES

The variables proposed for the evaluation are analyzed under the parameters proposed by Teichler(2018) : Academic background, academic and extracurricular performance during the career, time of search in the first job, improvement of skills through complementary training, work achieved after graduation, acquired competences related to the area of performance and complementary competences, Level of satisfaction with the results achieved and university teaching .

Note in Figure 1 the follow-up cycle headed by the time factor and proposed according to the actions prior to admission, during studies, in the adaptation process, and professional development, the scheme demonstrates the dynamics that follow the training and the importance of recognizing the most relevant aspects of the process in the follow-up to graduates

Figure 1
Common model of analysis of higher education



Source: (Teichler, 2018; Morueta et al. , 2015)

Under these parameters is proposed below a table of dimensions, variables and consistency that makes it possible to perform the required instruments based on the work of Morueta et al, (2015) as proposed in figure 1 a time cycle is determined before entering the university obtaining the student's admission data, which later will be of great importance when measuring goals and objectives met, as well as it will allow to evaluate the process of permanence, after the end of the educational process the graduate must pass a period of adaptation, in which he will seek job



stability, or start with an enterprise, to finally evaluate his employment situation that for this moment must be stable, this process is subject to a timeline of 3 to 5 years of permanence in the educational center and 5 to 6 years, time in which you will have consolidated, in most cases your employment situation. This analysis, assumes, the proposal of Morueta et al. , (2015)to develop the evaluation process, which can be seen in Table 1

Table 1
Dimensions, variables and internal consistency of the pilot instrument

Dimensions	Variables/Scale	Guy
Educational background	Access qualification	Ordinal
	Access rating	Ordinal
	Year of obtaining the title of access to the career	Interval
	Previous university studies	Nominal
Academic activity during studies	Average rating	Reason
	Study Abroad	Nominal
	Complementary academic activities	Ratio scale
	Leisure activities	Ratio scale
Search for the first job	Search for the first job	Nominal
	Career-related work	Ordinal
	Months of searching	Reason
	Search strategy	Nominal
	Aspects that influence the obtaining	Ordinal scale*
Complementary training	Completion of complementary training	Nominal
	Type of studies	Ratio scale
	Type of institution	Nominal scale
	Theme	Nominal scale
Employment and work after graduation	Main activity	Nominal
	Level of employment	Nominal
	Relationship with the race	Ordinal
	Duration of the contract	Ordinal
	Gross salary	Ordinal
	Type of company	Nominal
	Company size	Ordinal
	Job satisfaction	Ordinal
	Economic activity	Nominal
Occupational field	Nominal	
Basic and transversal competences	Basic competences acquired in the race	Ordinal scale*
	Core competencies required on the job	Ordinal scale*
	Transversal competences acquired in the career	Ordinal scale*
	Transversal competences required at work	Ordinal scale
Satisfaction with university resources and processes	Valuing teaching	Ordinal scale*
	Usefulness of didactic factors	Ordinal scale*
	Assessment of the career/university resources	Ordinal scale*
	Usefulness of the sugarcane	Nominal
	Choosing the same career	Ordinal
	Choosing the same university	Ordinal

Note: * RequiresCronbach's A lfa

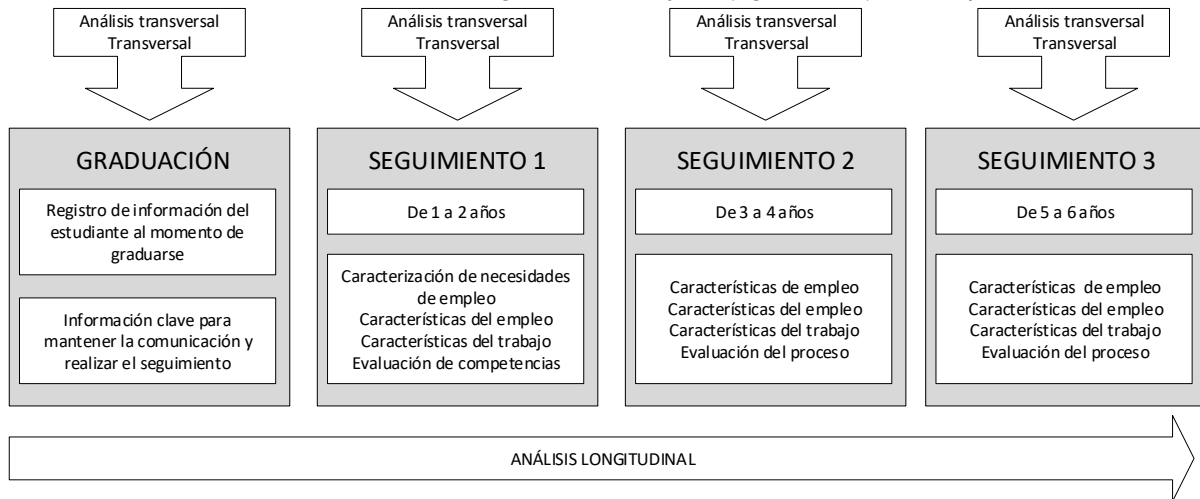
Source: Taken from (Morueta et al. , 2015) .



Inquiry process

The logic of inquiry of the model, is proposed based on a transversal analysis in such a way that you can have an objective perspective of the situation immediately and Longitudinal, with the purpose of linking the temporal factors to the conjunctural processes, schematizing a timeline that allows to observe the successes and shortcomings of the system and the potential solutions that can be applied.

Figure 2
Cross-sectional and longitudinal analysis of graduate follow-up



Fountain: (Teichler, 2018)

The type of information collected is related to the factors and variables depending on the cross-sectional and longitudinal analysis. In the first case, the information is obtained from the student's registration at the time of graduation, and timely information in three periods in an interval of 1 to 2 years, from 3 to 4 and from 5 to 6 six maximum. The accumulation of information and the comparative results between periods allow us to understand the dynamics of the process longitudinally.

According to this system, each graduate is followed in four moments, in periods of two years, in such a way that it begins upon graduation and then in periods that can be 1, 3 or 5 years or 2, 4 and 6 years, depending on whether in the year in which he graduated, An evaluation was conducted. The facilities that allow the computer links for the evaluation are of great help for the realization of the follow-ups, since they allow an immediate approach, that yes with voluntary collaboration, to the graduates, it is considered an adequate time of evaluation every two years, because the results allow to perceive in a better way the changes that are operated in the personal and professional development of the graduates, However, the system is flexible and must be carried out according to the information needs required by the different races. Systematically organizing the entry of information and obtaining relevant data is essential, for this reason, four evaluations are established every two years, per graduate. Increasing this frequency would considerably hinder the systematization, analysis and interpretation of the data in Table 2, the temporal logic of monitoring can be observed vertically and horizontally, considering the data collection and subsequent evaluations.



Table 2
Vertical and horizontal temporal dynamics of graduate follow-up processes

<i>Graduation year</i>	<i>Year of Observation</i>			
	2022	2024	2026	2028
2022	Graduate	2 years	4 years	6 years
2023		Graduate	1 year	3 years
2024			Graduate	2 years
2025				Graduate
2026				
2027				
2028				

Source: (Teichler, 2018; Morueta et al., 2015)

The foundation that is established, to consider this period of time, is the dynamics and evolution of educational processes, based on the needs of graduates, and the productive sectors that demand work, it is considered that in this period of time it is sufficient to perceive important socioeconomic, political and productive changes that are reflected in the monitoring and evaluation of graduates, An analysis beyond this period would basically reflect the labor stabilization of graduates. and not the changes that interest the institution of higher education for the updating, promotion, improvement and development in the administrative, curricular and linkage processes with the community.

ORGANIZATION OF RESULTS

The understanding of the phenomena around the needs of the graduate, the institution and society as a whole determine the relevance of the information obtained from the follow-up to graduates, so data analysis is considered important for the structuring of four types of information reports.

Report on employability. According to Tichler(2018), this aspect implies the skills and abilities of the graduate to achieve success in the work activities he performs; this report should include data on the form of labor insertion used by graduates, the level of relationship of the activity they perform with the career, the level of adjustment, size of the company in which he works, Probation time, duration of the contract, area of action of the company and sector of economic activity, the level of satisfaction achieved by the graduate with his work and all aspects that involve labor aspects and relationship of dependence with the employer, the greater the information in this sense, the understanding of the employment situation of the graduates will be micho broader and they will be able to work transversal skills that allow a better Decision-making capacity and work performance. This report implies the incidence of the time factor on the different aspects analyzed.

Report of academic journey and first job. - This record integrates the academic performance of the graduate, in the different stages of learning in the higher education center, integrating complementary and extracurricular activities, this report also includes training activities and potentiation of professional skills, through courses, workshops and other forms of preparation after graduation, Finally, the actions carried out by the graduate to obtain the first job, the means used, the help received are recorded.

Graduate satisfaction report. This instrument records the assessment of the graduate to the services that have been given in his period of studies in the institution of higher education, refers to the contents proposed in the curricular plan, the methodologies implemented, the resources in infrastructure, logistics and learning materials used , as well as the socio-cultural and political link implemented in a transversal way and how this learning influenced their labor relationship.



Report on the graduation profile. The registration of this information allows to know the level of competences acquired by the graduate throughout his university career. And the administrative, executive and operational capabilities that it is able to apply and manage.

The sum of the data obtained in the reports reflects the profile of the graduate, the skills acquired, the shortcomings in the face of the requirements of the labor market, and the certainty of having sufficient professional means and faculties to face the labor challenges that have arisen and to what extent the education received allowed to demonstrate competitive capacity, in the consolidation of an adequate work and congruent with the career and knowledge of the professional.

OPERATIONAL ORGANIZATION AND OBSERVATORY OF GRADUATES.

The work of the higher education departments aimed at monitoring graduates may or may not be part of the systems of linkage with the community, however, it is recommended that the aspects that interrelate these two activities of management in higher education is linked to meet the needs of the population and solve socio-economic and conjunctural problems that allow the development of society.

The administrative and operational instances that work in the follow-up to graduates, must be structured considering three fundamental aspects, the first, related to the institutional capacity to provide logistical and financial support for the achievement of an observatory to permanent graduates, whose work is specifically destined to this work, this implies infrastructure and special equipment as well as the hiring of permanent staff specialized in the formulation of instruments for the registration, systematization and dissemination of results.

The second aspect to consider is the coordination that must exist between this department with the area of curriculum planning, the different schools, academic units and academic commissions. It is not possible for this activity to be carried out in isolation and kept a low profile as a requirement to meet the requirements for accreditation.

The third fundamental aspect should be aimed at strengthening the capacity to externalize the results, so that they serve as a source of data to take actions in the strengthening of institutional capacities, management, research generation, scientific development and linkage with the community.

RESULTS OF FOLLOW-UP TO GRADUATES.

The pilot survey considered 89 graduates of the Chimborazo Polytechnic School, belonging to seven faculties, between 2010 and 2020. Of which 55.1% were men and 44.9% women, finding that there are no significant gender differences with respect to the responsiveness of graduates, which is similar to the average percentage of students by gender who have graduated from ESPOCH in the last 10 years, which is 52.3% men and 47.7% women, From which it follows that actions aimed at entrepreneurship are promoted from professional skills, rather than from the opportunities that may or may not be influenced by the gender situation.

Some data were considered that allow to have the necessary elements of judgment to consider the possible relationships that may exist between higher education and the labor demands that are generated from the action of the graduates, it is reported that the highest percentage correspond to the period from 2016 to 2020. The Faculty of Business Administration is presented with the highest percentage 32.6%. the other six faculties in almost identical percentages from 10.1% to 12.4%,

In relation to the time of existence, it was reported that a large majority 41.6% of businesses have less than one year, an average of 16% between two and three years, from 4 to 6 years less than 12.3%, only 12.4% of respondents, exceed in 6 years the existence of their businesses. In relation to the relationship of the businesses in operation with the profession of the respondents, 77.5% are related to the career. Regarding the form of the business, 48.3% of respondents started their businesses individually, 30.3% are family businesses, 16.9% are partnerships and only 4.5% community.

About how much I support the professional title for the implementation of entrepreneurship. 43.8% said nothing, 21.3% said that 34.8% said that professional titles supported them moderately and scarcely. A very important fact is the number of jobs they have been able to generate from their businesses, reporting that 76.4% have 1 to 5 direct workers, 12.4% from 6 to 10, from 11 to 15 workers 5.6% and in the same percentage more than 26 workers.

The correlation between the proposed factors allows us to understand the dynamics generated by higher education in a given period, the results obtained from the analysis are proposed below.

Table 3
Correlational analysis with the graduate time variable

Correlation	Pearson's Chi-Square Value	Degrees of Freedom	Level of Significance
Time of Graduation / Time of Business Existence	44, 926	25	,009
Time of Graduation / Business Form	27, 622	15	,024
Graduate Time / Places Generated	40, 579	20	,004
Time of Graduation / Degree Support	22,253	15	,101

Source: ESPOCH Graduate Surveys

The reported results of the analysis of Pearson's Chi-Square statistic show that there is a statistically significant relationship between the time of graduates, with the time of existence of the business, the forms of business and the places generated by the business, in the case of the relationship between the time of graduate and the support of the title to start your business is observed a Pearson Chi-square of 22,253 with 15 degrees of Freedom and a significance P value of 0.101 > to 0.05 which means that there is no significantly important correlation between these two variables.

Table 4
Correlational analysis with the variable time of existence of the business.

Correlation	Pearson's Chi-Square Value	Degrees of Freedom	Level of Significance
Time of Business Existence / Gender	6,362	5	,273
Time of existence of the Business / Faculty	43,041	30	,058
Time of Business Existence / Business Form	16,700	15	,337
Time of Business Existence / Places Generated	31,089	20	,054
Time of Business Existence / Title Endorsement	18,035	15	,261

Source: ESPOCH Graduate Surveys

The results of the correlational analysis of the variable time of existence of the business indicate that none of the variables compared has a statistically significant relationship with it, which can be seen in Table 2, that means that the gender of the entrepreneurs is not related to the time of existence of the company, this is that the fact of being a man or a woman does not condition in any way the tempo in which it is It keeps a business running.

Relating business time with faculty, it can also be observed that there is no statistically important relationship to ensure that the faculty from which the entrepreneur comes conditions the time of existence of his business.

Between the form of the business and the time of existence there is also no significant correlation which implies that the duration of the venture is not related to the fact of being individual, family, associative or community. Comparing the business time, with the variable of the places it generates, it is observed that there is no statistically significant relationship between these two variables, The variable time of the existence of the business correlates with the variable of support



of the title, observing that there is no significant relationship, that is to say that the title obtained in the university is not a guarantee to maintain a business during a certain period of time.

Table 5
Correlational Analysis with the Business Form Variable

Correlation	Pearson's Chi-Square Value	Degrees of Freedom	Level of Significance
Business Form / Gender	,706	3	,872
Form of Business / Faculty	27,833	18	,065
Business Form / Places Generated	19,657	12	,074
Business Form / Title Endorsement	7,554	9	,580

Source: ESPOCH Graduate Surveys

The form of business, considering the personal, family, associative and community factors, was correlated with the gender variable, determining a Chi-square value with 3 degrees of freedom and a P value of $0.872 > 0.05$ which means that the business form does not have a significantly important relationship with the gender of the entrepreneur, Which means that the fact of being a man or a woman does not condition in any way the way the enterprise was structured.

In the correlation between the form of business and the faculty in which the entrepreneur graduated, a chi-square of 27,833 was established with 18 degrees of freedom and a value of $P = 0.65$, which means that there is no statistically significant relationship between these two variables, so the faculty in which the entrepreneur graduated does not determine the way the business is structured.

In the correlation between the variable of the way in which the business was formed and the variable that analyzes the places generated by the enterprise, there is also no statistically significant relationship finding a Chi square of 19.657, with 12 degree of freedom and a value of $P = 0.074 > 0.05$, understanding that the way in which the entrepreneurship was carried out, Individual, associative, group or community does not affect the number of places that this can generate.

When analyzing whether there is a statistically significant correlation between the variables of the way in which the business was carried out and if the title was a backup, a chi-square value of 7.554 was found, with 9 degrees of freedom and value of $P = 0.580 > 0.05$ which means that the title did not influence in any way the way in which the venture was carried out.

Table 6
Correlational Analysis of places generated.

Correlation	Pearson's Chi-Square Value	Degrees of Freedom	Level of Significance
Places Generated / Gender	6,043	4	,196
Places Generated / Faculty	29,811	24	,191
Places Generated / Title Support	19,825	12	,070

Source: ESPOCH Graduate Surveys

Table 4 analyzes the results obtained from the correlational analysis of the variable places generated with the gender variable, finding a Chi-square value of 6.043 in 4 degrees of freedom, with a value $P = 0.196 > 0.05$ which indicates that the gender of the entrepreneur is not related to the places generated in the enterprise. In the relationship between the variable of places generated with the faculty in which the entrepreneur graduated is a chi-square of 29.811, with 24 degrees of freedom and a value of $P = 0.191 > 0.05$, which means that there is no statistically significant evidence that ensures that the faculty in which the entrepreneur graduated is related to the places generated by entrepreneurship.



Table 4 also shows the correlational analysis between the variable of places generated with the support of the title, reporting a Chi square of 19.825 with 12 degrees of freedom and a value of $P = 0.70 > 0.05$ which means that there is no significant statistical evidence to ensure that there is a relationship between the professional title and the number of places generated in the enterprise.

Table 7
Correlative Analysis of Title Support

Correlation	Pearson's Chi-Square Value	Degrees of Freedom	Level of Significance
Title Endorsement/ Gender	11,651	3	,009
Degree/Faculty Support	25,572	18	,110

Source: ESPOCH Graduate Surveys

The correlational analysis of title support in relation to gender, a value of Chi Squares of 11.651 was determined, with 3 degrees of freedom and a value $P = 0.009 < 0.05$, determining that there is a statistically significant correlation between these variables, so it can be said that gender affects the support of the title. Finally, the correlation between the degree support variable with the faculty of origin of the entrepreneurs reports a Chi-Square value of 25.575 with 18 degrees of freedom and a P value = 0.110 > 0.05 , which means that the faculty where the entrepreneur comes from does not affect the title as support to carry out an enterprise.

DISCUSSION.

The social transformations effect of the economic and technological changes that Ecuador has gone through in the last twenty years, have considerably transformed the labor structure, the (Pérez & Hurado, 2019) current productive indicators projected from the national development agenda (Donoso & Morocho) . imply urgent modifications in the approach and the way of articulating the real needs of the population with higher education (Ruiz et al, 2018).

In the interrelation of the State with the university, higher education has been gaining strength, as an actor of national development (Orozco et al. , 2020) , to achieve this objective, the academy has proposed strategies that make it possible to reflect on the impact of its actions and the identification of new training requirements linked to the different fields in which professional practice can be applied, proposing as one of the main challenges to evaluate the relevance of the different professional (Maggi & Paredes, 2017) careers . In this context, the institutions responsible for the evaluation and accreditation of education at this level demand that institutions develop evaluation systems, within which the follow-up of graduates is a fundamental factor in this process (LOES, 2010).

Currently, the follow-up of graduates is an important component in the administration of higher education institutions, according to Garzón this allows the regularization of quality management systems and the planning of processes that affect evaluation for accreditation and processes of continuous improvement of education. In the context of Ecuadorian universities, this process has made possible in recent years access to information related to the professional performance of graduates, the ability to undertake that they have demonstrated, but above all it has become a source of information that allows to visualize the quality of education that these professionals have received, as well as the new demands of the labor market and the requirements of the social environment (2018)(Martín et al, 2017).

The follow-up to graduates was included in the Organic Law of Higher Education, through the CEAACES agency that is responsible for ensuring the quality of Education and that is permanently evaluating the institutions of higher education in the country, in the model that has implemented uses a particular indicator related to the system of monitoring graduates, specifically in article 26, it considers that Higher Education Institutions through the National Secretariat of Higher Education, Science, Technology and Innovation (SENECYT) will design the procedures that are necessary for the design of a graduate monitoring system that will be part of the National Information System of



Higher Education of Ecuador. (SNIESE), depending on this regulatory framework, all universities and technological institutes have the obligation to monitor graduates (LOES, 2010) (Pallartoso & García, 2019)

This accreditation requirement has already had an important process of maturation and is manifested in Ecuadorian universities with different levels of response, in many universities it has been assumed with great enthusiasm, as is the case of ESPOCH that already in 2008 published the first results of a follow-up to graduates, as an initiative prior to the imposition of regulations, The study was based on the application of a survey to 5,500 students from six promotions, the study was complex depending on the difficulty of access to information that refers to the location of students (situation similar to what currently happens, despite the fact that technological means have facilitated the work), stratified random sampling was applied; the questionnaire applied considered aspects related to labor insertion, conformity with the level of knowledge received, relationship between the requirements of the labor market with the scientific and technological training received (Morueta et al., 2015).

Murueta and his colleagues say that, however, that an important database was obtained, the treatment given to the information was very general, so the study was never really used as a reference for the curricular design of ESPOCH, in addition the sample represented the institution of higher education before the careers offered.

The problem of the generalization of information was presented as a recurrent situation in many universities in Ecuador, as well as the case of a follow-up study of graduates carried out at the Eloy Alfaro Lay University of Manabí (ULEAM), reported by Cedeño and other authors, in which it is assured that the main problem is sampling, which is stratified random in which the strata are the degrees, obtaining, in the same way as in the case of ESPOCH a representative sample at the University level, but not at the career level, however that the ULEAM study is based on a sample of 974 graduates, definitely the results did not contribute significantly to sustain the specific aspects of the career, In addition, it is indicated that the study does not treat transversality, so time control is not handled, an elementary aspect in the context of labor insertion and generation of entrepreneurship. (2016)

In an analysis carried out by Chávez and other authors on the labor insertion of ESPOCH graduates in the specialty of Accounting and Architecture in companies in Riobamba, Ecuador, where this higher education center is located, it was found that in the period from March to September 2020, 27 graduates entered the public sector. 14 at the private level in private companies. Compared to the month of September of the same year where it was found that 4 graduates entered the public company, one graduated to private companies and also one to joint ventures, as a conclusion the authors of the research argue that the low level of income to the labor system is due to the global situation caused by the COVID 19 pandemic, However, it is a reflection of what was happening before this problem, it is ensured that higher education in Ecuador prepares students to enter to work directly in the bureaucracy, under dependence on the State or, failing that, as a workforce in private companies, which in reality are very few (2020) (Pérez et al, 2017), a situation that is due to the fact that graduates hardly manifest themselves in promoting their own ventures, which allow generating new jobs. In this research it was observed that there is no statistically significant relationship between entrepreneurship and the work capacity they generate. (Contreras & Wilches, 2017)

The aforementioned research has made it possible to have a criterion that allows to confront some ideas related to the labor insertion of graduates in the professional area and the generation of productive enterprises, as well as to have an idea of what the productive sector requires on the perception of the demand for professionals and the necessary skills to perform favorably in the labor field.

Like the proposed studies, the present research work is of an investigative nature, however it allows to appreciate interesting aspects related to the insertion and the work performance, with the purpose of evaluating and making a feedback to improve the curricular programs that have

been provided to the students, but that nevertheless have shown to lack of interrelation and systematization, with a significant lack of fundamental theoretical and methodological elements. The follow-up of graduates has proven to be a process whose results have not made it possible to reach or a valuation judgment that allows us to understand the scope pursued by the purposes and objectives of university careers in relation to labor needs and productive requirements of immediate environments, resulting in incomplete information and limiting the decision-making capacity to academic actors, producing an epistemological deface of pedagogical sciences that are definitely not consistent with the information collected from graduates and that contributes to the construction of educational schemes that tend to professional training, beyond university campus (Cedeño et al. , 2016) .

The difficulty with which the process of monitoring graduates is found from the perspective of the analysis carried out involves aspects such as: Difficulty in locating graduates, despite the advantages that technological innovations provide. The limited theoretical and methodological information, linked to the analysis and evaluation of graduates, which is why many Ecuadorian universities, comply with this requirement by activating a survey once for each period, set up a commission that is responsible for systematizing the data, are presented with superficial analysis to the control agencies and the data obtained are not taken as a source of information to influence curricular improvement. On the other hand, from the state agencies it is not clearly stated what are the foundations that should guide the evaluation of graduates. Evaluation is conceived as a formalism, limited by periods of time.

CONCLUSIONS


The importance and validity of graduate follow-up studies research has objectivity to the extent that it generates spaces for reflection and analysis based on the link between academia and the demand of the labor market. That it becomes visible through the relevance of the curricular planning that is developed within the institutions of higher education and that must be reflected in the permanent improvement of the quality of teaching, according to the needs of society.


From the analysis carried out, it has been established that the evaluation of graduates makes it possible to understand the impact of the training processes carried out during the periods of teaching and training to students and that the knowledge acquired is relevant. But also the results obtained constitute useful information for the assessment of the work and socio-productive environment and that reflects the most urgent needs of the population.

Considering the importance of the information produced from the analysis of the link between the university and society through labor results and the development of ventures promoted by graduates, implies that the academy assumes these processes with greater responsibility by assigning them the necessary resources to promote the generation of theoretical and methodological elements that are capable of guaranteeing research process with impact. And that certify the relevance and scope of the objectives of higher education institutions.

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