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Artículos científicos

Determinantes de la inserción laboral en egresados universitarios en México

Determinants of Labor Insertion in University Graduates in México

*Determinantes da inserção profissional em graduados universitários no
México*

Omar Alejandro Pérez Cruz

Universidad de Colima, México

omar_perez@ucol.mx

<https://orcid.org/0000-0003-3367-8259>

Rogelio Pinto Pérez

Instituto de Estudios Universitarios, Plantel Puebla, México

rogepipe@ucol.mx

<https://orcid.org/0000-0003-30579-6602>

Resumen

La diversidad de cambios económicos, tecnológicos y sociales que se han experimentado en la última década ha influido en el mercado laboral, en las formas de entender la configuración y la dinámica del empleo, en los procesos de transición entre educación y trabajo, en las estrategias de formación, así como en los progresivos ajustes entre los planes curriculares de las instituciones de educación superior y la iniciación e inserción de los egresados al mercado laboral. Este artículo expone una revisión de algunos de los factores centrales en torno a la relación entre la educación superior y el mundo laboral, con la finalidad de contextualizar la *empleabilidad* como concepto, práctica e instrumento de la política económica y educativa en México. El objetivo fue estimar la significatividad estadística que un conjunto de variables predictivas (titulación, elementos académicos, elementos curriculares y habilidades personales) ejerce sobre la dependiente (inserción laboral). Para tal fin, se ha implementado



un estudio de encuesta mediante una estrategia mixta (*online* y telefónica), al igual que un análisis econométrico, con datos panel y regresión de mínimos cuadrados ordinarios (MCO) con errores estándar corregidos. Los resultados muestran que los titulados, y más los titulados por el Examen General para el Egreso de Licenciatura (EGEL), se asocian significativamente con la inserción laboral. Asimismo, las variables de emprendimiento, trabajo en equipo, ambiente de trabajo, prácticas de talleres y laboratorios y manejo de las tecnologías de la información y comunicación (TIC) se asocian significativamente con la inserción laboral. Al gestionar estas variables, es posible incrementar la probabilidad de los egresados de insertarse en el mercado laboral.

Palabras clave: datos panel, inserción laboral, seguimiento de egresados.

Abstract

The diversity of economic, technological and social changes that the world has been experienced in the last decade has influenced the labor market, the ways of understanding the configuration and dynamics of employment, the processes of transition between education and work, the training strategies, as well as the progressive adjustments between the curricula of universities and the initiation and insertion of graduates into the labor market. This article presents a review of some of the central factors around the relationship between higher education and the world of work, in order to contextualize *employability* as a concept, practice and instrument of economic and educational policy in Mexico. The objective was to estimate the statistical significance that a set of predictive variables (degree, academic elements, curricular elements and personal skills) exert on the dependent (labor insertion). To this end, a survey study has been implemented through a mixed strategy (online and telephone), as well as an econometric analysis, with panel data and ordinary least squares (OLS) regression with corrected standard errors. The results show that graduates, and more those entitled by exam, are significantly associated with labor insertion. Likewise, the variables of entrepreneurship, teamwork, work environment, workshop and laboratory practices, and ICT management are significantly associated with job placement. By managing these variables, it is possible to increase the probability of graduates to enter the labor market.

Keywords: panel data, labor insertion, follow-up of graduates.

Resumo

A diversidade das mudanças económicas, tecnológicas e sociais vividas na última década tem influenciado o mercado de trabalho, nas formas de compreender a configuração e dinâmica do emprego, nos processos de transição entre educação e trabalho, nas estratégias de formação, bem como nos ajustes progressivos entre os planos curriculares das instituições de ensino superior e a iniciação e inserção dos licenciados no mercado de trabalho. Este artigo apresenta uma revisão de alguns dos fatores centrais em torno da relação entre o ensino superior e o mundo do trabalho, a fim de contextualizar a empregabilidade como conceito, prática e instrumento de política econômica e educacional no México. O objetivo foi estimar a significância estatística que um conjunto de variáveis preditivas (titulação, elementos acadêmicos, elementos curriculares e habilidades pessoais) exerce sobre o dependente (inserção laboral). Para tal, foi implementado um estudo survey, com estratégia mista (online e telefone), bem como uma análise econométrica, com dados em painel e regressão de mínimos quadrados ordinários (MQO) com erros padrão corrigidos. Os resultados mostram que os graduados, e mais os graduados pelo Exame Geral de Bacharelado (EGEL), estão significativamente associados à colocação profissional. Da mesma forma, as variáveis de empreendedorismo, trabalho em equipe, ambiente de trabalho, oficinas e práticas laboratoriais e gestão de tecnologias de informação e comunicação (TIC) estão significativamente associadas à colocação profissional. Com o gerenciamento dessas variáveis, é possível aumentar a probabilidade de os graduados ingressarem no mercado de trabalho.

Palavras-chave: dados de painel, colocação de emprego, monitoramento de graduação.

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Introduction

The multiplicity of technological and economic advances that societies have experienced in recent decades has influenced the way of conceiving the labor market, the ways of understanding the training and preparation processes for the workplace, the skills and professional skills that the sector business demand, as well as in the gradual structuring of educational programs for different academic profiles.

At the national level, the progressive acceleration of labor dynamics will continue to increase as the markets in North America and the Pacific basin are integrated, and the supply and demand of specialized human talent increases in the commercial context of the treaties. commercials that Mexico maintains.

Higher education institutions, as organizations responsible for training qualified human talent (and that, therefore, integrate the statistics of the economically active population), are constantly pressured to update their study programs to adapt them to more regional contexts : Programs are shaped according to the current demands of the labor market and the future requirements of each profession. In this sense, updating the study programs requires that objective information be analyzed on the students' school trajectories, from their entry to the educational level until their graduation, graduation and follow-up after one, three and five years of graduation. In such a way that objective data on the job placement process are obtained, which should be taken into account when redefining the strategic direction of educational organizations.

Taking into account the above, researchers and academics have begun to generate evidence on the factors that influence the labor insertion of recent graduates from higher education institutions. This article is part of this line, since it aims to estimate the statistical significance that a set of predictive variables (degree, academic elements, curricular elements and personal skills) exerts on the dependent (job placement).

The problem in question here was addressed in the following order. In the first place, the factors that have constituted, at least partially, the practice of labor insertion under scenarios of functional and structural unemployment are pointed out. Second, the relationship between job placement and education was analyzed. Next, the Ordinary Least Squares (OLS) methodology is exposed, which is applied to a sample of graduates from a higher education institution in western Mexico. Finally, the results are discussed and courses of action are suggested that, from the academic point of view, may be effective.

Labor insertion and unemployment

The labor insertion of graduates of higher education institutions, as a matter of employability, is a "set of skills and attitudes that allow a person to get and keep a job" (Real Academia Española [RAE], 2019). Job placement is related to the percentage of advancement in two different goals: training and the economic system. On the one hand, a reasonable balance is needed between the criteria of academic training (knowledge, skills and attitudes) and the requirements of the job. Together, both are necessary elements to develop successfully in the labor field. On the other hand, it is necessary to balance the number of graduates from higher education institutions and the absorption capacity of the economic system in working conditions appropriate for their professional profiles.

When the academic training received by young people and the job requirements of the economic system do not match, an economic problem is generated: unemployment. According to Cárdenas, Guataquí and Montaña (2015), unemployment can be explained by the lack of balance between labor supply and demand, and is characterized by two typologies: functional and structural. The corresponding Wikipedia entry (August 23, 2020) indicates that functional or frictional unemployment is the lack of voluntary employment: when a worker decides to leave a position for a time to find another with better economic, labor or cultural conditions. This means that unemployment is exercised in a discretionary manner, in search of rest, studies or a better job. Therefore, this type of unemployment is dependent on the needs of each worker. Taking care of a family member, starting a new level of studies, changing place of residence, even staff turnover due to organizational climate issues are some of the various reasons. It should be noted that this type of frictional unemployment is also called rotation or search unemployment. The interference of higher education institutions here is high, since it is about adjustments in academic training.

Now, Antunes and Pochmann (2012) explain that when the mismatch occurs between the number of graduates of educational organizations and the absorption capacity of the economic system, structural unemployment arises. This mismatch, as it is not an exclusive problem for recent graduates, entails deep debts between academic training and the economic system, which implies a deficit in employability, and especially, the expansion of the limitations for the employment of graduates (Piana, 2019).

These barriers are the result, in addition to the technological vortex that underlies economic development, of the business tendency to toughen the selection criteria for the

occupation of their job vacancies (Ribes, 2017). Such is the case in some Latin American countries. Thus, the supply of skills that graduates have developed in their training is out of phase with respect to the demands of the labor market. And these mismatches between the training system and labor demands have led to the unemployment of graduates (De La Hoz, Quejada y Yáñez, 2012).

Job placement and education

Students who graduate and try to enter the labor market for the first time do not reflect on the barriers to entry and what it takes to enter the economically active population. According to Chung (2019), in this transition stage, young people face a series of difficulties that demand the putting into action of a range of specific skills and competencies necessary to be able to efficiently capitalize on the learning acquired over four years. five years of training. Although there are no predetermined formulas to guarantee obtaining a job, there are more or less significant indicators that guide efforts to obtain a space in the labor market, or at least, that increase the probability of obtaining said space. In this regard, Bourdieu (1986) points out that there are three types of capital that contribute to job success: economic, social and academic capital (incorporated, objectified and institutionalized).

In this order of ideas, Martínez and González (2019) point out that the labor insertion processes of graduates of higher education institutions represent a highly relevant field of studies, although poorly analyzed. As part of the current literature, there are investigations of this topic from different perspectives. From one of social classes, for example, Fachelli and Navarro (2015) provide evidence on social origin and labor insertion. Rodríguez (2018) analyzed the cultural and human capital determinants of women's entry into the labor market. While Martínez and Carmona (2010) developed an instrument to identify and evaluate socio-personal factors and thereby arrive at the success factors of job placement in young people.

The possibility of locating research linked to the regional contexts in which the training process of future graduates takes place allows adjusting programs, curricular plans and training strategies with greater relevance to immediate reality. On the other hand, studies on global contexts favor the design of long-term strategies. In addition, due to their qualities of dynamism and flexibility, they are easy to adapt to future needs and different national trends.

Methodology

As mentioned, the objective of this research was to estimate the statistical significance that a set of common variables has on job placement in graduates. For this, a total of four generations of the Bachelor of Medicine at the University of Colima were taken as a sample in the period between 2014 and 2017.

The alternate hypotheses are as follows:

H₁: Job placement is significantly related to the degree.

H_{nula}: Labor insertion is not significantly related to the degree.

H₂: Job placement is significantly related to professional factors.

H_{nula}: Job placement is not significantly related to professional factors.

H₃: Job placement is significantly related to curricular factors.

H_{nula}: Job placement is not significantly related to curricular factors.

H₄: Job placement is significantly related to teaching factors.

H_{nula}: Labor insertion is not significantly related to teaching factors.

It should be noted that these same hypotheses have been implemented in other investigations (Cabello, May 10, 2016; González, Vila y Guisado, 2016; Martínez and González, 2019).

Regarding the dependent variable, the model that was estimated here considered the following: Labor insertion. While the independent variables were: Degree, Professional, Curricular and Teacher Factors, which are shown in table 1.

Tabla 1. Descripción de las variables

Dimensión	Clave	Descripción
Año	AO	Del año al año (XXXX-XXXX).
Inserción laboral	Emp 02	Trabaja o no trabaja.
Titulación	Tit01 y 02	Titulado: a) Sí b) No Titulado por Examen General para el Egreso de Licenciatura (EGEL), tesis, promedio.
Factores profesionales	Dp 101 al 111	La puesta en práctica de los conocimientos adquiridos.
Factores curriculares	Dp 201 al 220	Contenidos teóricos y prácticos en escenarios académicos y reales.
Factores docentes	Dp 301 al 314	Aspectos de los profesores que se relacionan con la carrera.

Fuente: Elaboración propia

It is also important to mention that the nominal dependent variable had two response options, that is, it was dichotomous. As the interest of this study is to estimate the statistical significance associated with working or not from a set of independent variables, an econometric analysis was chosen, with panel data and OLS with corrected standard errors.

This statistical methodology to measure the correspondence between education level and labor participation is the panel type model. In this way, the statistical data were structured in a panel, where the observation unit is structured in two dimensions, one of a transversal type and the other by time series. This type of statistical design improves the reliability of the estimates by expanding the number of observations that are analyzed with respect to the generations of graduates from the educational program studied, which allows greater control of the hypothesis. In this sense, and taking up the information presented in the previous table, the multiple regression linear model was established as follows:

Inserción laboral

$$= \alpha + \beta_1 \text{titulación}_{it} + \beta_2 \text{factores profesionales}_{it} \\ + \beta_3 \text{factores curriculares}_{it} + \beta_4 \text{factores docentes}_{it}$$

Donde $i = 1, 2, 3 \dots 32$ y $t = 2014, 2005, 2016, 2017$.

Once the variables were established, a first analysis was run with several independent variables to verify the significance with the dependent one. From the correlations obtained, those independent variables that did not correlate with the dependent one were eliminated. Table 2 shows the final model.

Tabla 2. Descripción de las variables del modelo final

Dimensión	Clave	Indicador	Descripción
Año	AO		Del año al año (XXXX-XXXX).
Inserción laboral	Emp 02		Trabaja o no trabaja.
Titulación	Tit01 y 02		Titulado: a) Sí b) No Titulado por EGEL, tesis, promedio.
Factores profesionales	Dp 102	Emprendimiento	La capacidad para iniciar, mantener o poner en práctica ideas propias para la obtención de productos o servicios.
	Dp 104	Trabajo en equipo	La capacidad para trabajar coordinadamente con otras personas en proyectos conjuntos.
	Dp 108	Ambiente de trabajo	La capacidad para trabajar armoniosamente con otras personas en proyectos conjuntos.
Factores curriculares	Dp 215	Manejo del riesgo	La disposición para asumir y administrar riesgos controlados.
Factores docentes	Dp 304	Prácticas de talleres y laboratorios	Aspectos de los profesores que se relacionan con la carrera.
		Manejo de las Tecnologías de la información y la comunicación (TIC)	Conjunto de habilidades para el manejo de recursos digitales.
		Liderazgo	Conjunto de habilidades para influir sobre personas o grupos.

Fuente: Elaboración propia

Obtaining the statistical correlation between the variables made it possible to eliminate as far as possible the unobservable heterogeneities of the data panel, trying to control the individual nature of each entity, and correct, when necessary, the problems of heteroscedasticity and autocorrelation that occurred in the final model. Thus, the following results were reached.

Results

To correct the autocorrelation and heteroscedasticity problem that was presented and to obtain greater reliability in the results, the panel corrected standard errors (PCSE) estimator was applied, which is shown in the following table 3.

Tabla 3. Participación laboral en México

Variable dependiente		
Titulación		
Variable independiente	Coefficiente	Std. Err.
Titulado	0.1015	0.0568
Titulado por EGEL	0.1570	0.0523

* Significativa 1 %. ** Significativa 5 %. *** Significativa 10 %.

Fuente: Elaboración propia

In the previous table it can be seen that both variables, Titration and EGEL Titration, were significant.

Table 4 shows the following analysis, which estimated the correlation of the same dependent variable with other independent variables.

Tabla 4. Participación laboral en México

	Variable dependiente		
	Inserción laboral		
Factores	Variable independiente	Coefficiente	Std. Err.
Profesionales	Emprendimiento	0.2361**	0.0993
Profesionales	Trabajo en equipo	0.3776*	0.1057
Profesionales	Ambiente de trabajo	0.2950*	0.0976
Curriculares	Disposición para el manejo del riesgo	0.1177	0.0902
Docentes	Prácticas de talleres y laboratorios	0.2215*	0.0812
Docentes	Manejo de TIC	0.2214**	0.1043
Docentes	Liderazgo	0.1819	0.0681

* Significativa 1 %. ** Significativa 5 %. *** Significativa 10 %.

Fuente: Elaboración propia

Regarding table 4, it can be seen that the factors that were significant were those included in Professionals and Teachers.

Individually, the indicators that integrate the factors that obtained significant values were: Entrepreneurship, Teamwork, Work environment, Workshop and laboratory practices, and ICT Management.

The Entrepreneurship, Work Environment and Workshop and Laboratory Practices indicators showed a positive trend. This explains that when graduates start their own ideas for products or services, they integrate more quickly into the labor market, which is consistent with the results of García (2015). Likewise, Work Environment and Practices carried out in workshops and laboratories increase the possibility of entering the labor market, results that are in line, for their part, with those of Gallegos (2005).

On the other hand, the variables Teamwork and ICT Management also have a significant relationship with a positive trend. This explains that the greater of these competences, the greater the possibility of labor insertion. The results of González, Vila and Guisado (2016) share this vision.

Finally, the results also show that it is necessary to adjust the study plan of the degree in Medicine, so that the curricular contents impact on the labor insertion of its graduates. For this, the support of the academic staff is required, which must ensure the strengthening of the professional skills of its students.

Discussion

The purpose of this research was to estimate the statistical significance that a set of predictive variables (degree, academic elements, curricular elements and personal skills) exerts on the dependent (labor insertion). For which four hypotheses were designed.

The first hypothesis relates job placement with the students who graduated, which was accepted. This explains that the degree has an influence on job placement; It is even more significant to have graduated from the EGEL, since this exam allows knowing the level of knowledge and skills of undergraduate graduates, based on standardized tests by the National Evaluation Center for Higher Education (Ceneval). Barrera, Canepa and Santiago (2016) show similar results. In the case of the sample analyzed in this research, it is especially significant that the graduates have a job, due to the health and professional regulations demanded by the State, in addition to the professional culture of the doctors. This result coincides with that of Cabello (2016) and that of Vargas and Rivera (2006), who worked with dental students.

Hypotheses two (professional factors) and four (teaching factors) were also accepted. These results are in line with Martínez and González (2019), who explain the relevance of

the professional (personal competences) and teaching (linkers) aspects. Likewise, Rivas, Cardoso and Cortés (2019) explain how they influence the current job placement process.

These results also show that universities must manage employability through strategies aimed at promoting these types of factors. Thus, real social participation will be promoted that strengthens the university-labor market relationship and, by extension, will open up greater job opportunities and long-term objective job profiles. Without a doubt, the results obtained here are of interest to academics, researchers and people who develop public policies.

Conclusions

Analyzing the effects of the correspondence between job placement and education by monitoring graduates implies starting from the diversity of professional skills.

The objective of this research was to estimate the statistical significance that a set of predictive variables (degree, academic elements, curricular elements and personal skills) exerts on job placement. Labor insertion is an issue that generates greater concern from the role of universities in determining social development in Mexico.

From the results obtained in this research, it is clearly shown that the hypotheses raised by the estimates developed provide sufficient empirical evidence on the relevant role of universities and higher education institutions in national employability, a situation that is taken up in various studies already mentioned.

Finally, based on the results found in this empirical analysis of the role of universities, it was verified that degree, professional, academic and curricular factors positively impact the job placement of doctors in the country, in this case specific. However, and even when these factors are significant, efforts on job placement and graduate follow-up are still incipient in Mexico, which is why, based on this work, various future lines of research are proposed to serve as a guide to model their impact on the country's education.

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Rol de Contribución	Autor (es)
Conceptualización	Omar Alejandro Pérez Cruz
Metodología	Omar Alejandro Pérez Cruz
Software	Omar Alejandro Pérez Cruz
Validación	Rogelio Pinto Pérez

Análisis Formal	Omar Alejandro Pérez Cruz
Investigación	Rogelio Pinto Pérez
Recursos	Rogelio Pinto Pérez
Curación de datos	Rogelio Pinto Pérez
Escritura - Preparación del borrador original	Omar Alejandro Pérez Cruz
Escritura - Revisión y edición	Omar Alejandro Pérez Cruz
Visualización	Omar Alejandro Pérez Cruz
Supervisión	Omar Alejandro Pérez Cruz
Administración de Proyectos	Rogelio Pinto Pérez
Adquisición de fondos	Rogelio Pinto Pérez