

MARCO AURELIO NAVARRO LEAL & RUTH ROUX**COMPARING LABOR INSERTION OF GRADUATES FROM TWO AREAS OF KNOWLEDGE IN THREE MEXICAN LOCALITIES****Abstract**

Engineering programs are commonly supported by higher education policy and planning initiatives on the grounds of a supposed saturation of the labor market by other types of educational programs. However, labor market saturation is dependent on the economic characteristics and the sociocultural capital of specific locations. The aims of this study were twofold: (1) to examine the differences in the labor situation and wages earned by graduates in law-administration, and engineering in three Mexican localities (Reynosa, Victoria and the Tampico-Madero-Altamira metropolitan area); and (2) to identify the factors related to those differences. The research questions addressed were: What working positions do graduates acquire by disciplinary group and locality? What wages do graduates earn by disciplinary group and locality? What factors influence graduates' positions and wages? Results indicate that engineers were not always better located and paid than the other group.

Introduction

For the purpose of this study, the concept of labor market is considered as the place where supply and demand of work meet (Navarro Leal, 2000). "Labor insertion" is understood as the achievement and performance of graduates in an economic area or sector (Barrón, 2003). "Labor location", on the other hand, is defined as the position of graduates in the segments of the organizational hierarchies of business (Carnoy, 1977). Finally, a graduate is an individual who has successfully completed a four-year long program of higher education (Navarro Leal, 2000).

Theoretical approaches to examine the complex relationships between the world of education and the world of work may be grouped in two schools of thought (De Vries, Vazquez-Cabrera & Rios-Treto, 2013; Muñoz Izquierdo, 1996; Navarro Leal, 1982). The first group of theories is supported by classical economics, such as the theory of Human Capital (Denisson, 1972). The second group includes emergent or alternative theoretical approaches that cast evidence of the insufficient explanatory power of the Human Capital theory. These theories are based on explanations of the sociology of education, examples of which are: screening theory, diploma disease, and market segmentation theory, among others (Carnoy, 1977).

Research carried out in the State of Tamaulipas, Mexico, has analyzed the working conditions (employment, unemployment, and misemployment), wages, occupations, and locations of graduates in different disciplinary fields. Results have shown that to explain positions and wages of graduates in the division of labor, categories that come from the so called "emergent" theories are required. These categories include non-school terms that refer to the social class and gender of graduates (Navarro Leal, 2000)

More recent research has shown that graduates of the same program have different opportunities of insertion and levels of wages in different places of the state of Tamaulipas. These results have led to other research questions related to the

factors of the local contexts that have different specific weights in conditioning the insertion of graduates and the corresponding wages in the labor market (Navarro Leal, Lladó, Sánchez & Cruz, 2009).

Lessons learned from previous research indicate that the economic structure of the specific localities, the relative intensification of the supply of professionals of different fields of knowledge, the social and political characteristics of the population and organizations, as well as the growing flexibilization of some professional practices in emergent conditions of “outsourcing” should all be fully taken into account when formulating higher education plans. This study considered these issues to compare two professional groups: one that includes different fields of engineering and another that includes professionals from law, accountability and business administration.

Methodology

In the state of Tamaulipas, located in the northeast corner of the country, there are 206,144 individuals who completed with higher education studies. From these, 27,293 are in Reynosa, 37,353 in Ciudad Victoria and 74,125 in the metropolitan zone of Tampico-Ciudad Madero-Altamira. To calculate the sample, we used the formulae recommended by Fisher de la Vega and Navarro (1984) for populations of less than 500 thousand subjects. The sample sizes for each locality were the following: Reynosa = 818; Victoria = 819; and the metropolitan zone = 819. To investigate the proportion of law-administration, and engineering graduates in each sample size, we worked on two assumptions:

Assumption 1

The distribution of professionals by fields of knowledge in Tamaulipas reflects the structure of enrolments in the Mexican higher education system by fields of knowledge. This assumption implies that the distribution of graduates in the State of Tamaulipas and enrolments have a similar structure.

Assumption 2

In the absence of a directory of graduates, by fields of knowledge and localities, the probability of the field worker finding a graduate from one of the two groups is the same.

When analyzing Assumptions 1 and 2, it was taken into account that the fields studied does not consider all fields included in the statistics of higher education, and do not include all professional fields by knowledge area, therefore actual proportions by professional fields are unknown.

In focusing the problem from this view, decision was taken assuming that professionals could be found at their homes up to accomplish half of the sample size of a group and to accomplish the other half of the other group. Having the two groups of the same size allows for the comparison of pairing variables from both of the sets of attributes.

The following set of principles was adopted for the administration of the questionnaires:

1. The group of engineers was to be represented by graduates from the fields of electricity, electronics, mechanics, industrial, or equivalents.
2. The group of law & administration was to be represented by graduates from the fields of law, administration and accountability.

3. The amount of questionnaires to be administered in each locality would be around 800, considering a half of them for each group.
4. The questionnaires were to be supplied not at work but at home of the graduates since we are also including information from those who are unemployed.
5. To make sure that samples were representative of different socioeconomic situations, the questionnaires were to be proportionally supplied among different sectors of localities, therefore different sectors were considered as:
a) high socioeconomic level, b) medium-high socioeconomic level, c) medium-low socioeconomic level, and d) low socioeconomic level.

Main findings

The empirical research in three localities of Tamaulipas, Mexico, with different economical characteristics, allows for reflections about relativity of theories to make thorough explanations about relations between the worlds of education and work, given that socioeconomic and educational features of localities differ and are determinants. Engineering and law-administrative fields were selected for being contrasting fields that allow for room for different comparisons about the working insertion of graduates in different localities.

Graduates working position and income in the metropolitan area

The metropolitan area of Tampico-Madero-Altamira as an integrated labor market expands opportunities of inhabitants to live in one of these cities, to study in a second and to work in a third city. On this integrated scenery, the size of the industrial sector is larger than the one that Tampico could have by itself, where traditionally the sector of services has been the largest, especially by the branch of commerce.

The supply of professionals from the law-administrative fields is very large in terms of the amount of university programs and enrollments in such a way that competence among them is higher than the competence among engineers when applying for a job. On this scenario the engineers working position and income is better off than professionals from law-administrative fields. A student t test indicated a statistically significant difference between the two groups.

Graduates working position and income in the city of Victoria

In the City of Victoria findings are different from above. There is not a significant difference in the work insertion neither in the incomes between the two professional groups. In the economic structure of this locality highlights the governmental service which is three times larger than the industrial sector, in terms of the proportions of the Economically Active Population (EAP).

This finding led to explore other non school factors, like those related with social class, working segment of the father's job, real estate properties, but in none of these significant differences were found. But when analyzing gender relations it was observed that in the sample of graduates from engineering there were just a little amount of women, around a tenth; while in the sample of graduates from law & administration women were the halve of the subjects.

The analysis of the differences related to the segments insertion and incomes between men and women showed a statistically significant difference in favor of

men. On the other hand, as women represented a 50 % of the graduates from law & administration, but with a segment insertion and income lower than the engineer's, it could be assumed that if women could get an insertion and income similar to men, this group would be able to equalize its position to the engineer's. The consequence would be that in the City of Victoria, by the size of the services sector, this group would be better positioned and paid than the engineers. In any case this point could be a research project by itself.

Graduates working position and income in Reynosa

Results for Reynosa were different from those of Victoria. Engineers were living a more favorable circumstance in terms of sectorial structure and intensity of educational supply. Firstly, the industrial sector of Reynosa is similar to the services sector in terms of their proportions in the Economically Active Population. Secondly, the intensity of the supply was similar in both cases. Although the programs and enrolments of engineering were larger than those for law and administration, the number of graduates was not very different. For instance, in the school year 2005-2006, there were 608 graduates from engineering, while there were 628 graduates from the law & administration fields. It was expected that in equality of circumstances there were no significant differences between the two groups. Nevertheless engineers were better located and paid than the other group. The analysis should be extended to include non-school factors related to social and cultural capital.

Recapitulating, on the factors conditioning a better labor insertion and income of graduates, it was found that it was not enough to have a high scholarly level. However, graduates were required to live in a location with the right circumstance of pertinence and competence. In short, this was the main original finding of this research on the relationships between higher education and work.

Recommendations for further research

Findings of the study suggest that the concept of pertinence has a different value for each locality and that the level of pertinence of programs depends on the specific local circumstances. Therefore, planning of higher education should not be based on subjective judgments such as "market saturation" and more consideration should be given to "professional elasticity", "professional substitution" and "flexibility of labor". Higher education should be conducted on the basis of research to support the supply and reorientation of educational programs for specific socioeconomic contexts, rather than macroeconomic needs.

Results call for new lines of research and projects. For instance, in Victoria requires more studies on issues of gender; women seem to resist studying engineering. Also, the government is the main source of employment in Victoria and little is known about its hiring policies and gender equality practices.

For the case of Reynosa it is possible that a higher competence in the supply of professionals (or a high rotation) brings different effects among economic sectors. For the industrial sector it is possible that a higher competence among the engineers brings as a consequence a new need to retain them in the firms, by means of better salaries, while probably this will not be the case for the graduates from the law & administration.

This research also gives input for the design of public policies, which for their effective evaluation should consider research on the specific circumstances of the localities, otherwise it will be difficult for higher education to contribute with opportunities for new generations to find their place in the dynamics of development.

References

- Barrón, C. (2003): Los Estudios de Seguimiento de Egresados en el periodo 1992-2002. In *La Investigación Educativa en México 1992-2002. Educación, Trabajo, Ciencia y Tecnología*. México: COMIE.
- Carnoy, M. (1977): Education and Employment: A critical appraisal. *Fundamentals of Educational Planning* 26, Paris: IIEP-UNESCO.
- De Vries, W., Vázquez-Cabrera, R. & Rios-Treto, D. (2013): Millonarios o malparados: ¿de qué depende el éxito de los egresados universitarios? *Revista Iberoamericana de Educación Superior (Ries)*, Vol. IV (núm. 9), 3-20.
- Denisson, E. (1972): Education of the labor force. In B. R. Cosing, *Education structure and society*. TU Press, 80-87.
- Fisher de la Vega, L. & Navarro, A. F. (1984): *Introducción a la investigación de mercados*. México: Fondo Editorial Interamericano.
- Muñoz Izquierdo, C. (1996): *Diferenciación Institucional de la Educación Superior y Mercados de Trabajo, Seguimiento de egresados de diferentes instituciones a partir de las universidades de origen y de las empresas en que trabajan*. México: ANUIES.
- Navarro Leal, M. (1982): Un enfoque teórico del seguimiento de egresados. *Enlace III* 20(46).
- Navarro Leal, M. (2000): *Posponer la Vida. Educación Superior y Trabajo en Tamaulipas*. México: Porrúa.
- Navarro Leal, M. (2009): A manera de epílogo. ¿Qué hemos aprendido? ¿Hacia dónde vamos? En M. Navarro Leal, D. M. Lladó, L. I. Sánchez & L. Cruz, *Profesionistas y Mercados Laborales en el Estado de Tamaulipas*. Ciudad Victoria, Tamaulipas: Universidad Autónoma de Tamaulipas, 145-148.
- Navarro Leal, M. A., Lladó, D. M., Sanchez, L. I. & Cruz, L. (2009): *Profesionistas y Mercados Laborales en el Estado de Tamaulipas*. Ciudad Victoria, Tamaulipas: Universidad Autónoma de Tamaulipas.

Prof. Dr. Marco Aurelio Navarro Leal
marcoarelionavarro@yahoo.com.mx
Dr. Ruth Roux
rrouxr@uat.edu.mx
Universidad Autónoma de Tamaulipas
Mexico