

## Analysis of graduation rate as an indicator of quality. Postgraduate case study in the area of social sciences and humanities

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**Abstract:** In Mexico, the postgraduate educational system has been in greater demand according to the needs of the professional and work context, for this, Higher Education Institutions offer postgraduate specialization, master's and doctorate degrees. In Mexico, based on the National Association of Universities and Institutions of Higher Education (ANUIES), it is reported that for the 2019-2020 school year there was an enrollment of 384,614 students enrolled in various educational establishments. What reinforces the increase of scientists and professionals in various fields, however, at the moment that an applicant becomes a registered student, the criteria for entry, permanence, follow-up, graduation and terminal efficiency, makes an educational program a success, due to the fact that, when the number of students who entered the postgraduate degree,

In this sense, this document presents 6 postgraduate educational programs in the area of Social Sciences and Humanities based on a comparison of the indicators of graduation and terminal efficiency of 2 master's degrees and 2 doctorates belonging to the National Quality Postgraduate Program of the National Council of Science and Technology with 2 master's degrees that do not belong to the aforementioned National Program.

**Keywords:** CONACYT, graduation rate, quality, postgraduate.

### 1. Introduction

The National Council of Science and Technology —CONACYT— in Mexico is an institution that has existed for fifty-one years. It is a decentralized public body of the State, not sectorized, with legal personality and its own patrimony, it enjoys technical, operational and administrative autonomy; Its objective is to be the advisory entity of the Federal Executive and specialized to articulate the public policies of the federal government and promote the development of scientific research, technological development and innovation in order to promote the technological modernization of the country.

In this sense, the strengthening of public policies is formal education through the training of researchers through the creation and financing of scholarship programs, as well as training researchers and scientists in various modalities, as well as integrating information from scholarship programs offered by other national institutions, international organizations and foreign governments.

Essential aspects of training, development and connection are central axes that it establishes to meet local, regional and national priorities with a global scope.

Conacyt has the most important Scholarship Program for Postgraduate Studies in Mexico, with more than 45 years of existence; It is known and recognized nationally and internationally, this program provides access to the population to carry out high-level studies in academic institutions of excellence, both in the country and abroad. Through the different modalities of the Program, scholarships are awarded to carry out postgraduate studies at the master's, doctorate and post-doctorate levels, in addition to supporting various technical and academic specialties. The mission of this Council is to promote continuous improvement and quality assurance of the national postgraduate program, which supports the increase of the country's scientific, technological, social and humanistic capacities (CONACYT, 2020a).

According to the statistics of the Register of the National Quality Postgraduate Program (2021), at the end of 2020 there were 2327 postgraduate degrees (specialty, master's and doctorate) of professional orientation and research. Which implies generations of graduates inserted in the professional and labor market with knowledge, skills, attitude and competent quality aptitudes to meet the demand in their field.

In this sense, it is pertinent to consider the scope and implication of studying a Postgraduate course belonging to and with the recognition of the PNPC. Since it is understood that quality as the degree to which a set of differentiating features of the postgraduate programs reach the need or established standards. It is also the ownership of a postgraduate degree that meets the standards or criteria established in the CONACYT frame of reference, considering two criteria: 1) training of the people who complete the program and 2) the institution's ability to produce changes that improve that training (CONACYT, 2011).

The foregoing leads to considering the student's academic performance as well as monitoring it in terms of integrating their academic trajectory in a timely manner, positively impacting the indicators of completion and terminal efficiency (López et al., 2008), which allows the educational institution to ensure quality as well as to comply with the institutional commitment acquired before the CONACYT for permanence and, if possible, a higher level of the educational program.

### 1.1 Indicators that determine the quality of a quality graduate degree in Mexico

The educational quality of a postgraduate program allows to identify the fulfillment of the mission and vision of the same, since if not, it gives the opportunity to identify the weaknesses and be able to redirect the academic, curricular and administrative dimensions, to the respective Chaparro & Barrera establish the following considerations for the quality and accreditation of a graduate program:

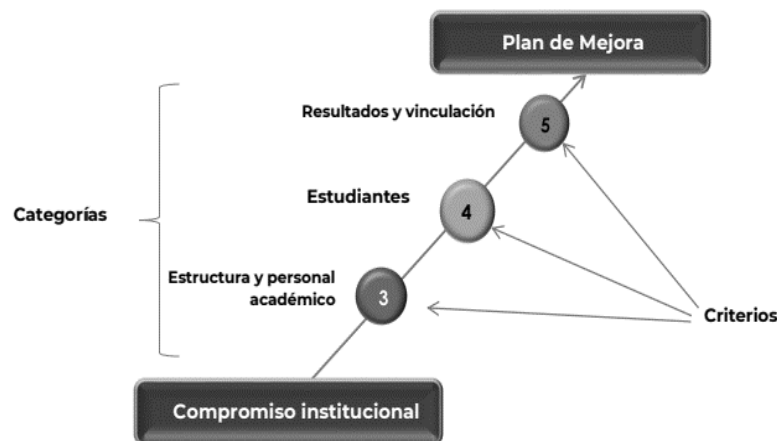
"Self-evaluation generates valuable information in terms of the necessary consolidation of the educational model and training strengthening of the teachers of the Basic Academic Nucleus, in addition to providing elements to guide the follow-up of students from admission to their subsequent graduation from the program" (Chaparro & Barrera, 2018, 123).

The indicators (qualitative or quantitative parameters) allow to measure the fulfillment of the established objectives in relation to the criteria to be evaluated with respect to the activities foreseen in the PNPC categories since each of the criteria is evaluated with one or more associated indicators.

Compliance with the indicators provides a quality assurance of the postgraduate program, since the actions carried out by higher education institutions or research centers result in an effective quality management of the program.

Achieving compliance with the indicators results in a correlational task between the figures of the postgraduate academic coordinator, the administrative coordinator (institutional figure), students and teachers (Hernández et al., 2020).

For CONACYT, quality assurance resides in the criteria that the postgraduate must meet in case of entering, staying and ascending a level (recent creation, in development, consolidated, international competition) for this it must contemplate the categories referred to in the Reference Framework (CONACYT, 2020b) regarding:



Fountain: CONACYT, 2020.

The category is understood as the items of analysis of the conditions that the program must meet for admission, permanence and promotion. The criteria are referred to the trend of an activity typified in the program, they allow to analyze progress of the knowledge acquisition process from its planning to the results. They are verifiable, relevant and specific, with guidance and predictive capacity. They are formulated in a qualitative way, leaving wide degrees of freedom for their adaptation to the orientation and type of postgraduate degree.

The institutional commitment falls on the responsibility of the institution with respect to training with quality and justification of social relevance, scientific guaranteeing financial resources for academic activities. The

Improvement Plan integrates the strategic decisions about the changes that must be integrated into each evaluation criterion.

When the student enters the postgraduate course, the follow-up that is granted supports satisfactory indicators in the graduation and terminal efficiency.

### 1.2. Egress and terminal efficiency

In the educational programs of each Higher Education Institution, the graduation indicator is attached to the graduation profile, because they are the attributes of attitudes, knowledge, skills, and values that students who study a postgraduate program must meet at the end of their studies. of the same. So there must be congruence with the study plan.

Terminal efficiency is understood as “the total number of students who complete the requirements of a specific study cycle. It can be calculated taking as a reference the number of students who complete the cycle in a given period, in relation to the total number of enrolled in the same period; or considering the proportion of students in a cohort that ends in a certain period in relation to the number of students that make up the cohort” (CONACYT, 2011).

These aspects take for granted that the postgraduate system constitutes an alternative for social and economic development (Aguirre et al., 2019) in the Mexican state, training human resources with academic quality capable of facing processes of global, national, regional and economic integration. local (Bastiani et al., 2018).

For the above, it is important to foresee the study of graduates, which is described as a base instrument for self-evaluation and accreditation of educational programs of social compliance and relevance of graduation profiles (Valencia et al., 2015), which implies continuous attention in the updating or restructuring of the study plan and programs, in addition to ensuring educational quality from the association of other indicators such as the accompaniment of the student by a team of teachers -tutorial committee- (Martínez et al., 2020); infrastructure, linkage and mobility mechanisms that allow the student to meet and cover in a particular way a good academic performance, ensuring in the course of their academic career those academic and administrative requirements that contribute to graduation, facilitating the obtaining of the degree. An important aspect is the degree modality, for which in our study the object of study is "thesis" which is conceived as a reception research work aligned to a theme according to the Lines of Generation and Application of Knowledge.

Consequently, the evaluation before accredited bodies and internal self-evaluation processes (Zavaleta et al, 2018), seek a follow-up to the postgraduate through indicators based on parameters, allowing to attend through various mechanisms a good development of the postgraduate.

## 2. Method

The methodology used in this document is of a mixed approach (Garza, 2013) applying the documentary method from the direct consultation of primary and secondary information sources (Villaseñor, 2008). Based on the consultation and analysis found in the document, the information was categorized, which proceeded to systematize it. To understand its dynamics, the descriptive method was applied, as well as the consultation of all those plans and regulations and regulations.

Official and institutional databases of the National Association of Universities and Institutions of Higher Education -ANUIES-, Institution of Higher Education, CONACYT, Mexican Council of Postgraduate Studies-COMEPO were used, analyzing characteristics, graduation statistics and terminal efficiency in order comparing them between the graduate degrees belonging to the PNPB with those that are not accredited is a PNPB graduate degree.

Once the formulas were applied, the postgraduate statistics were analyzed during the last 6 years. This is due to the fact that, in four out of six programs, their periods are biannual, that is, from their creation in 2014, there are only 2 or 3 generations on average for their study. On the contrary, in the case of a professionalizing postgraduate degree not belonging to the PNPB, as it is a semester educational program, there is a greater margin of field of study by analyzing a larger number of generational cohorts. Given the above, the academic indicators for each program are presented below.

## 3. Results

A comparison was made between 6 postgraduate courses belonging to Area V: Social Sciences, which focuses on the study of Administration, Political Science and Public Administration, Communication, Accounting, Demography, Law and Jurisprudence, Economics, Geography and Sociology, in its aspects basic and applied, generating and applying new knowledge.

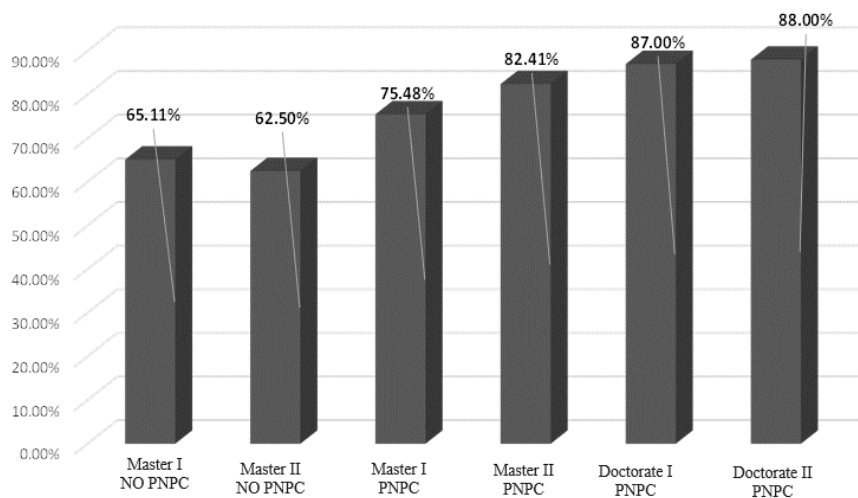
An Institution of Higher Education with 4 postgraduate degrees (2 masters and 2 doctorates) recognized in the PNPC and two (masters) not belonging to the PNPC was selected as the object of study, with the aim of comparing quality and quality assurance in terms of the criteria for graduation and terminal efficiency of educational programs.

**a) Terminal Efficiency**

For the study of the criterion of terminal efficiency, the total number of graduates per cohort was considered in comparison with new students who completed their postgraduate studies in the time established according to their study plan.

In this sense, the Master's programs are determined for a period of 2 years and the Doctorate for 3 years. Therefore, it can be observed that 88% and 87% of terminal efficiency are occupied by PhDs. It is worth mentioning that, in this case, the reference analysis was carried out with two generations, since they were created in 2014 and have three generations in total, but only two have graduated at the end of 2020.

Regarding master's degrees not recognized in the PNPC, one started in 2016, has 2 generations of graduation, however, it only has 62.50% efficiency, and the other master's program has 65.11% as shown in the Figure 1.



**Figure 1.** Postgraduate Terminal Efficiency 2014 - 2020.

TERMINAL EFFICIENCY RATE PER COHORT						
No.	POSTGRADUATE	ANALYSIS PERIOD	NUMBER OF COHORTS	No. of Nvo students (NANI)//	No. of graduates per cohort (NEC)//	Average terminal efficiency
1	Master I NO PNPC	2015 - 2019	7	201	129	65.11%
2	Master II NO PNPC	2016 - 2020	2	7	4	62.50%
3	Master I PNPC	2014 - 2020	3	16	12	75.48%
4	Master II PNPC	2014 - 2020	3	35	28	82.41%
5	Doctorate I	2014 - 2020	2	16	14	87.00%
6	Doctorate II	2014 - 2020	2	21	19	88.00%
					Average Terminal Efficiency Rate by Cohort	76.75%
				296	206	

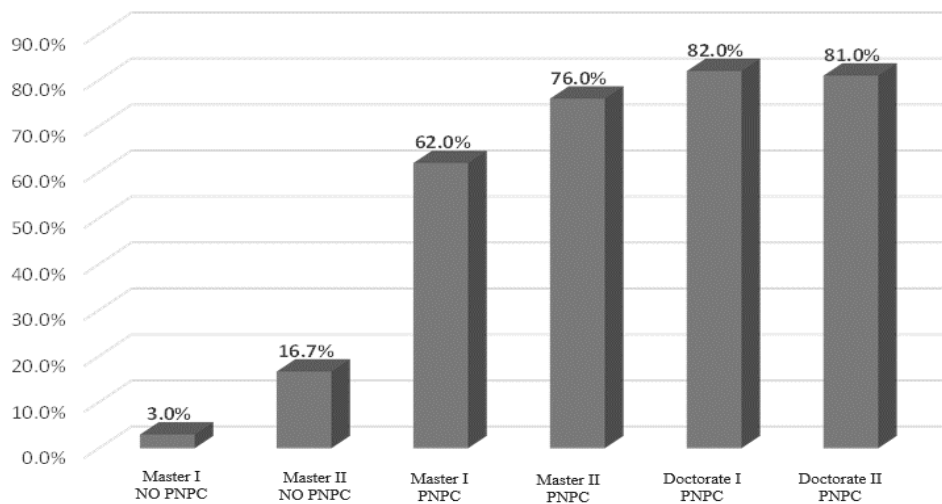
FORMULA	
TERMINAL EFFICIENCY RATE PER COHORT/ $TECT = \left( \frac{NEC}{NANI} \right) \times 100$	<b>77%</b>
TETC= Terminal Efficiency by Cohort No. Graduates per cohort. Total number of students who completed 100% of the credits NEC= of their Postgraduate study plan in the established time.	
No. New Students. Total number of students entering the university for the first time (including those who revalidate or carry out equivalency) in the periods established by the NANI = Educational Institution according to the duration of the Study Plan of the Postgraduate Educational Program.	

Source:  
 / Formula of the Institutional System of Indicators (SII)  
 // School Services System -

**Figure 2.** Terminal Efficiency rate per cohort.

**b) Graduation rate**

When it comes to the graduate degree or graduation rate (as it is known), there are two scenarios. On the one hand, there are the indexes of graduate students with an examination certificate with a period no longer than their year of graduation, in comparison with new students, which is the case that is analyzed in this section and on the other. On the other hand, it should be noted that there is the other scenario where graduate students with degrees are taken in the same way compared to the number of graduates. This is how it is observed that the greatest problem in terms of Graduation Rate is found in one of the NO PNPC Master's Degree. The figures are alarming, since, taking into account 100% of the students mentioned above, who enter the NO PNPC Master's Degree, so far from 2015 to 2020, Only 3% on average of the total number of students entering their first semester have managed to graduate. This indicates that students, if they complete their postgraduate degree, but are unable to complete the degree process within a period of no more than one to one year after completing their studies, which does not allow them to obtain the degree.



**Figure 3.** Graduation rate.

GRADUATION RATE BY COHORT /						
No.	Postgraduate	Generational Cohort	Number of cohorts	No. Total students in the cohort (NANI)	Graduated students By cohort (NAGC)	Graduation rate
1	Master I NO PNPC	2015 - 2019	7	201	6	3.0%
2	Master II NO PNPC	2016 - 2020	2	7	1	16.7%
3	Master I PNPC	2014 - 2020	3	16	10	62.0%
4	Master II PNPC	2014 - 2020	3	35	24	76.0%
5	Doctorate I	2014 - 2020	2	16	13	82.0%
6	Doctorate II	2014 - 2020	2	21	18	81.0%
					<b>Average Graduation Rate by Cohort</b>	<b>53%</b>
					296	72

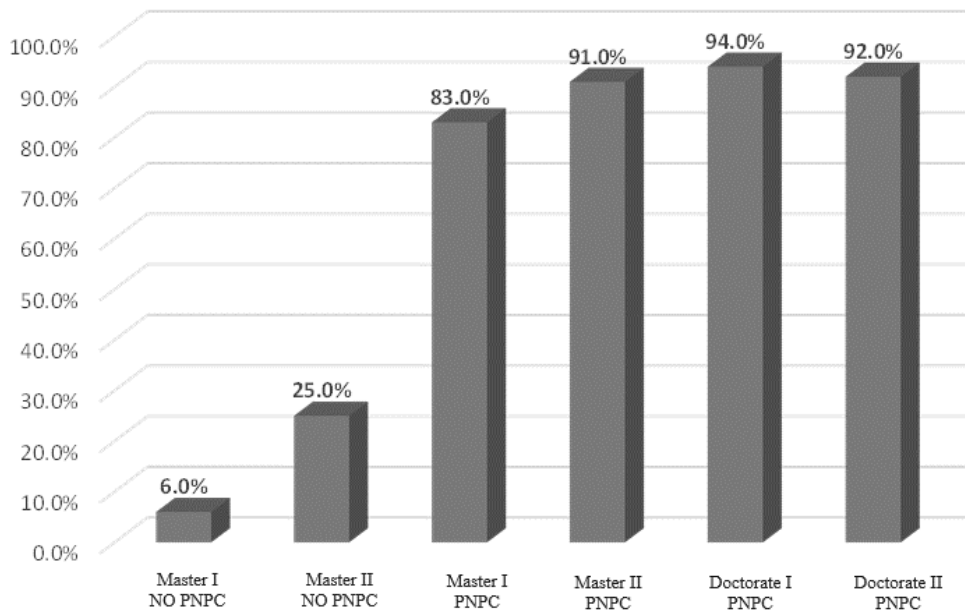
FORMULA	
GRADUATION RATE BY COHORT /	$TGC = \left( \frac{NAGC}{NANI} \right) \times 100$
TGC = Graduation Rate by Cohort	<b>53%</b>
NAGC = Number of Graduated Students per Cohort (NAGC). Number of students who obtain the academic degree (the date established in the certificate of professional examination with approval opinion), in a time not exceeding one year of graduation.	
NANI = No. New Students. Total number of students entering the school for the first time university (including those that revalidate or carry out equivalency) in the periods established according to the duration of the Study Plan of the Postgraduate Educational Program.	

Source:  
/ Formula of the Institutional System of Indicators (SII)  
// School Services System -

**Figure 4.** Graduation rate by cohort.

c) **Efficiency rate in graduation.**

In relation to the total number of graduates compared to graduates, the figures vary, with the highest percentages being the educational programs of the National Register of Quality Postgraduate Programs (PNPC), which mostly have 90% of graduates with degrees over time. established one year of graduation. It is important to emphasize Master I, which despite having 129 graduates compared to 14 of Doctorate I, most of the enrollment of postgraduates, its percentage of efficiency in graduation does not exceed 10%.



**Figure 5.** Graduation efficiency rate.

EFFICIENCY RATE IN GRADUATION BY COHORT /						
No.	POSTGRADUATE	GENERATIONAL COHORT	NUMBER OF COHORTS	NO. GRADUATES PER COHORT (NEC)	NO. OF STUDENTS GRADUATED PER COHORT (NAGC)	GRADUATION EFFICIENCY RATE
1	Master I NO PNPC	2015 - 2019	7	129	6	6.0%
2	Master II NO PNPC	2016 - 2020	2	4	1	25.0%
3	Master I PNPC	2014 - 2020	3	12	10	83.0%
4	Master II PNPC	2014 - 2020	3	28	24	91.0%
5	Doctorate I PNPC	2014 - 2020	2	14	13	94.0%
6	Doctorate II PNPC	2014 - 2020	2	19	18	92.0%
Average Efficiency Rate in Graduation by Cohort						65%
				206	72	

FORMULA	
EFFICIENCY RATE IN GRADUATION BY COHORT/	$TEGC = \left( \frac{NAGC}{NEC} \right) \times 100$
TEGC =	Graduation Efficiency Rate by Cohort
NAGC =	Number of Graduated Students per Cohort (NAGC). Number of students who obtain the academic degree (the date established in the certificate of professional examination with approval opinion is considered), in a time not exceeding one year of graduation.
NEC =	Total number of students who completed 100% of the credits of their study plan, satisfactorily complied with the provisions of the Graduate Regulations in the established time
<b>65%</b>	

Source:  
/ Formula of the Institutional System of Indicators (SII)  
// School Services System

**Figure 6.** Efficiency rate in graduation by cohort.

This comparative research established educational indicators that give guidelines to consider qualitative aspects in the execution of the postgraduate degree in terms of a good follow-up of academic trajectory, decision-making and implementation of strategies to reduce, mitigate those internal and external factors that affect educational programs and educational policies.

The indicators of graduation and terminal efficiency in the PNPB graduate programs comply with a percentage greater than 60% due to the monitoring of the students through tutorial committees, which support the student during their academic journey through the graduate program, focused on complying with the curricular progress designed in the curriculum map and trajectory. In addition to anticipating the progressive progress of the thesis in each academic period, which is reported to the academic and administrative coordinators of the postgraduate course. The work of the academic and administrative coordinators is essential since actions are combined at specific times that allow meeting requirements in a timely manner.

Regarding postgraduate courses not belonging to the PNPB, the postgraduate Master II, even though it is an educational program that was created after the PNPB, the results have not been satisfactory, because it lacks elements such as follow-up, assignment ed committee tutorial, beginning, advancement and conclusion of the reception work of the thesis during the academic trajectory of the student, which implies that, when the student graduates, the consideration of topic selection, development and conclusion of it still begins, which implies institutionally a mismatch and non-compliance with terminal efficiency.

In the case of Master, I, it is an educational program that, unlike PNPB and Master II postgraduate courses, which are postgraduate with biannual entry, Master I considers entry on a semester basis since 2006. The indicator of permanence and graduation of the student is not less than the average, however, it impacts on the terminal efficiency because the student lacks elements to develop a reception thesis work, such as a professionalizing postgraduate course aimed at those people who work, the student invests upon graduation the time in their professional and work activities, leaving aside the beginning, development and conclusion of the thesis. This postgraduate course, being semester, has a demand for admission between 15 to 20 applicants, however, there are a lack of mechanisms, strategies and actions that strengthen terminal efficiency.

#### 4. Discussion-Conclusion

When the analysis and evaluation of indicators of graduation and terminal efficiency in postgraduate programs is approached, the guarantee of the quality of higher education is also evaluated, because in the professional and labor market the discrepancy of the acquired competences can be presented and the demand of the labor market.

Terminal efficiency and graduation are measurable indicators that indicate the capacity of the educational institution to attract, train, employ and grant resources that society provides. Therefore, the Study Plan and the formation of a curricular map substantially contribute to the professional profile of the student, in addition to it, indicators such as a study of relevance and feasibility, entry profile, graduation profile, mission and vision of the study plan. They represent a filter in the admission process of those applicants to graduate school, which means that those who comply and enter graduate school as enrolled students, are students according to the educational program and who meet the academic and administrative requirements.

In the case of the postgraduate courses described in the document, it can be seen that the master's and doctoral degrees belonging to the PNPB are postgraduate courses that currently comply satisfactorily with graduation and terminal efficiency. Indicators that are consolidated due to the fact that from the moment the student enters the postgraduate course, a follow-up is given through the tutorial committee in charge of accompanying the student mainly in reception work, since this document is developed at the same time as the student takes their subjects.

Regarding postgraduate degrees that are not recognized in the PNPB, a deficiency is reflected in the terminal efficiency indicator. What impacts the graduate and institutionally, because it does not comply within the established period, resulting in the loss of the studies carried out.

Undoubtedly, educational quality is measured by criteria and indicators described above, however, aspects such as permanence, graduation and terminal efficiency, turn out to be an important factor for postgraduates in acquiring and maintaining educational quality. The high demand for PNPB postgraduate programs at CONACYT and the periodic evaluation of educational programs allow the identification of strengths and weaknesses –SOT- which in turn require an improvement plan with actions and strategies defined in short, medium and long-term periods. An aspect that is lacking in postgraduate courses not belonging to the PNPB, resulting in unfavorable indicators for the student, the educational program and the institution.

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