



The postgraduate degree at UNAN-Managua and its relationship with nicaraguan society I: history and current affairs

PhD. Álvaro Antonio Escobar Soriano

PhD and M.A on Education and Social Intervention
UNAN-Managua

<https://orcid.org/0000-0001-6566-3006>
aescobar@unan.edu.ni / alvess007@gmail.com

Submitted on May 5th, 2019 / Accepted on August 20th, 2019

<https://doi.org/10.5377/torreon.v7i20.8553>

Keywords: postgraduate, history, news, the road traveled, modernization, implications.

SUMMARY

This article summarizes synthetically and objectively the first part of the documentary analysis that aims to: a) present the current postgraduate description at UNAN-Managua, based directly on the Institutional Improvement Plan (POAI 2015-2019), and in a particular way with the 2017 Annual Operating Plan, without neglecting its historical development. The postgraduate course at UNAN-Managua has gone through two phases: the first one, which we call initial, was developed in the 1980s; the second phase, which we call diffuse expansion. The current description of the postgraduate can be done from several dimensions that are directly related to your work. The knowledge of these happens to perceive the social impact of the postgraduate course developed in the university as well as possible. Therefore, it is necessary to make its performance and its relationship explicit and objective with the national reality following the axes: relationship with the State institutions, relationship with the private company and relationship with the community.

1. INTRODUCTION

This article summarizes in a synthetic and objective way a documentary analysis that has the following objectives: a) to present the current postgraduate description at UNAN-Managua, based directly on the Institutional Improvement Plan (POAI 2015-2019), and in a particular way with the 2017 Annual Operating Plan, without neglecting its historical development.

Among others, the main conclusions of this study are: a) the postgraduate degree at UNAN-Managua starts a new stage -consolidation, and modernization- oriented to the ordering and development of research and innovation, b) in order to obtain added value of the knowledge produced, it is necessary to measure the impact of the research carried out and explore the feasibility of developing other areas, c) the integration of teaching and research is necessary to increase its effect in degree and in the national reality and d) lack of development processes Self-evaluation of programs, in all their categories.

2. MATERIAL AND METHODS

The present study is documentary research from a historical perspective. The approach with which it was developed was qualitative. The content analysis of different documents related to the institutional management, in which specific data on the postgraduate work is presented, was carried out. In addition, documents of national specialists and international institutions were taken into account as theoretical referents that support some approaches and findings.

Information collection techniques were: bibliographical revision, checklist, and comparison. With the documentary review, we managed to track and locate the bibliographic sources that contributed to the data for the study. The checklist (contained the analysis categories that were sought in each document), was used to classify the reports according to the time periods in which they were elaborated, which allowed the reconstruction of two stages: initial and diffuse expansion.

The comparison allowed the analysis of the findings in relation to the theoretical perspectives approached. Another dimension, which allowed to develop this technique, was the coherence between the data and the narrative that was configured from the descriptions found in the different reports on the object of study.

With the application of each technique, data was obtained from the reports, which were recorded in tables and subsequently were constructed different graphics that reflect significant aspects for the realization of the work of the postgraduate in its historical dimension as current.

The analysis of the information was carried out for periods, this resulted in the structuring of a critical-reflective report which led to conclusions and recommendations (implications), that

allow not only to have a synthetic vision of the postgraduate work but also to improve prospects for the near future.

3. RESULTS

After the investigation into the documentary sources and their corresponding analysis, the following results were reached. These are presented both from a historical view and the current consideration of the work of the graduate in UNAN-Managua.

It can be said that the postgraduate in the UNAN-Managua has crossed two phases: the first, which we call initial, developed in the '80s with the opening of postgraduate studies in health sciences (creation of the CIES that is currently a University Research Centers); the second phase, which we call of diffuse expansion, comprises a long period ranging from the nineties to topicality, in which a kind of graduate *boom* occurs in the different types that are recognized by higher education¹.

3.1. Initial Phase: 80's

To understand the development of the initial post-graduate phase at UNAN-Managua, brief contextualization is required. That is to say, to locate the reasons why this initial phase had its origins in the efforts that the national universities encouraged to make a qualitative leap and not to fall behind, in relation to the progress that the rest of Latin America was having, on the subject of higher education studies, especially in the graduate level.

In Nicaragua, postgraduate education was initiated in the late 1960s. The first postgraduate courses and programs were directed to the business administration and the high management and were taught by the Central American Institute of Business Administration (INCAE), established in the country since 1964. In this same period, the National Autonomous University of Nicaragua UNAN-León began offering the specialties of internal medicine, general surgery, obstetrics, and pediatrics. In the 70s, the Central American University (UCA) developed several graduate courses aimed at training staff.

In the decade of the 80s, the postgraduate has a fundamental advance in two stages: 1) the medical specializations offered under the agreement between the Ministry of Health (MINSA) and the UNAN-Managua (this is still in force) were reinforced, under the logic of improving the health care of the Nicaraguan people, and 2) with the creation of the Higher Education System of Higher Education, under the leadership of the National Council of Higher Education (CNES), the UNAN-Managua as independent autonomous entity –also the majority of the country's universities– gave a strong boost to the training of teachers in service.

1. This section is based on the CNU Postgraduate Report (2005)

The last stage began to be concretized through courses offered by the national universities, with the support of visiting professors and solidarity with the Popular Sandinista Revolution, and by scholarships granted to teachers –equally funded by friends of the Revolution, are worth highlighting among them the Cuban republics of Cuba and the USSR– to conduct studies outside the country.

In addition, the logic outlined in subparagraph one, from the substantive function of teaching, both strategic actions, were driven to raise the academic level of universities, which became the most democratic source of inclusive training in Central America.

3.2. Diffuse expansion phase: period 90 – 2017

The second phase, which we call a diffuse expansion, comprises a long period ranging from the nineties to present, in which a kind of postgraduate *boom* occurs in the different types that are recognized by higher education.

In the decade of the 90s, the academic level of the teachers improved in most of the public universities, in the same way, increased the offer of postgraduate in health sciences, sciences of the education and humanities, right, economy, natural sciences, and environment. Masters were developed in some of the areas of knowledge with support from the Catalan Association of Professionals for Cooperation (ACPC).

At UNAN-Managua, the training of teachers in-service presented an upward trend since 1990. In this year, 84% of professors were graduated; the percentage that was reduced in 1995 to 48% and in 2003 to 27%. In July 2004, postgraduate training had undergone significant development, 72. 99% of the plant teachers had postgraduate studies (specialization, mastery or doctorate) and they performed masters and doctorate studies at 99 professors, 77% of them studied in Nicaragua and the remaining 23% in Canada, Costa Rica, Colombia, Spain, Switzerland, Denmark, and Sweden. In the latter country, 11 young professionals studied in the fields: environmental chemistry, ecotoxicology, solid waste management, biotechnology, hydrology, geotechnics, and applied geophysics.

By increasing the postgraduate population in the university, and with the return to the country of the teachers in training abroad, the so-called diffuse expansion phase begins. Graduate teachers both abroad and those trained under Spanish cooperation encourage initiatives, most of the time supported by peer groups, to develop graduate studies at the level of professional expertise and masters. These programs are mainly promoted in the areas of health, education, telecommunications, and economic sciences.

The trend of postgraduate studies at UNAN-Managua, developed between 2004 and 2017 (graph No. 1), is biannual data, that allow comparing two decades (odd and odd), considering that the opening of each program has an average of two years dependent on the type of studies.

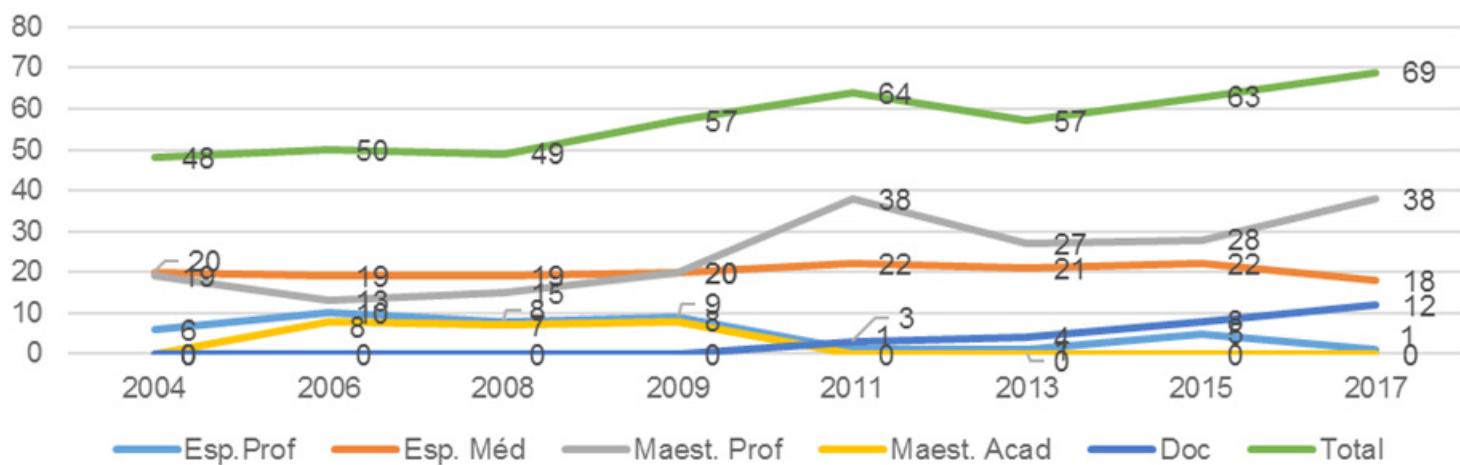


Figure 1. Trends in graduate studies at UNAN-Managua 2004 to 2017. Sources: Post-Graduate Reports CNU, 2004, 2006, 2008, 2009, 2011, 2013, 2015. Source: Physical-financial report. III quarter 2017. Managua: UNAN-Managua.

In the same figure 1, the trend of the development that has reached this subsystem can be seen. Professional specialization has undergone a decline, from 6 programs in 2004 to 1 in 2017, This is related to the advancement in demand for professional master's programs that have increased from 19 to 38 in this same period of a little over a decade. Since 2004, the postgraduate programmes of UNAN-Managua accounted for 36.6 % of the postgraduate offer of the CNU member universities (Graduate Report CNU, 2005).

According to quarterly reports, academic master's programs have experienced a decline from 8 in 2006 to 0 in 2017. However, this data is inaccurate, while reports have tended to raise both professional and academic programs on the label. However, in the registries of 2017, in the Postgraduate Management, 15 programs of academic masteries² are counted, taking as benchmark hours and credits for their classification³. Doctoral programs have gone from 1 in 2011 to 12 in 2017, experiencing rapid growth, what must impact effectively on the work of the institution in the next quinquennium, on topics such as the research, publication, and impact of the graduate in Nicaraguan society.

The programs with the greatest offer are the Masters, whose quarterly percentage variation has been between 56% and 62.3% of the total of programs (69) reported to the 3rd quarter of 2017 (figure 2). However, in particular, the greatest demand are medical specializations, offered by the Faculty of Medical Sciences, followed by the offer of the Faculty of Education and Languages.

2. Report data requested by CASUCA (2016) research and postgraduate indicators of UNAN-Managua.

3. Academic Master 24 months, 1500 to 2300 hours, 76 credits. Regulation of the Postgraduate Studies and Continuing Education System SEPEC-UNAN-Managua, (2011).

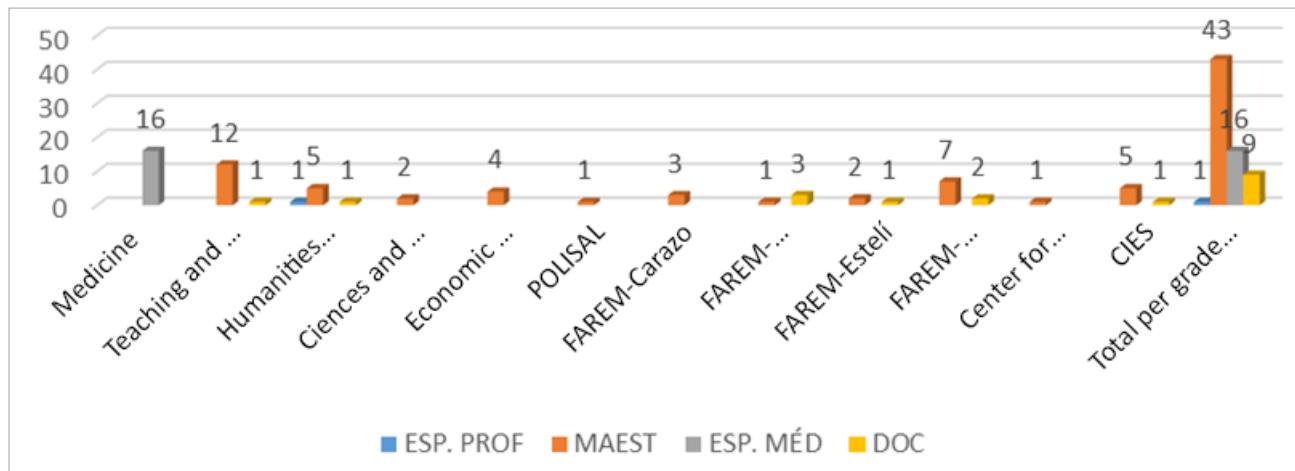


Figure 2. Number of postgraduate majors offered by Faculty, POLISAL, Centres and Research Institutes III quarter 2017 (69). Source: Physical-Financial Report. III quarter 2017. Managua: UNAN-Managua.

This growth coincides with the demand for training, which is experiencing the postgraduate course in the present decade, specifically, of programmes of specialization from the institutions of the State, which agrees directly with “the social demands and the necessities presented in the National Plan of Human Development” (Physical-financial report. Quarterly III, 2017).

3.3. The postgraduate and its current dimensions

The current description of the postgraduate can be made from several dimensions that relate directly to your work. To start, the university has a normative document that regulates the functioning of the graduate. In relation to the level of application of this instrument, the transitional provisions express: “The CD-SEPEC within two years, as of the adoption of this Regulation, will evaluate its effectiveness of application in the academic units and, every five years will perform its updating” (*Regulation of the System of Postgraduate Studies and Continuing Education, SEPEC-UNAN-Managua, 2011*, p. 50). This provision in its first part was not realized, in the indicated time, because, with the expansion of the post-graduate period in the last decade, the look was oriented towards the solution of demand and its implications in human, physical and financial resources. However, at the end of the first five-year period of the decade, the task indicated in the second part of the provision, which has indefinitely provoked an operative reverberation towards the evaluation of it.

3.3.1. Knowledge areas and postgraduate studies

The areas of knowledge in which the research lines are organized in the graduate of the UNAN-Managua are: “Economic and Business Sciences, Education, Humanities, Social and Legal Sciences, Natural Sciences and Environment, Exact Sciences Engineering and Technology,

Health Sciences and Agricultural Sciences" (*Regulation of the System of Postgraduate Studies and Continuing Education, SEPEC-UNAN-Managua, 2011*, p. 35).

It can be expressed that, from a different approach to the previous one⁴, the areas that have been most developed in relation to the number of programs are Humanities, Agricultural Sciences, Technology Engineering, Natural Sciences, Social Sciences and Medical Sciences (figure 3). Among them are the Medical Sciences, which in 2017 offers 16 programs of medical specialization.

3.3.2. Retention, promotion, qualification

In relation to retention, promotion, and qualification, these are related to the tuition. It is worth noting, in the context of the second stage, that the programmes give an indistinct opening, from the point of view, these open according to the demand (they are self-financed, financed by state institutions or by the same university).

In observing the tuition behavior, the trend was to growth, in the first two quarters of 2017 (from 1603 to 2184 students respectively), but in the third, this descended to 2108 (figure 4).

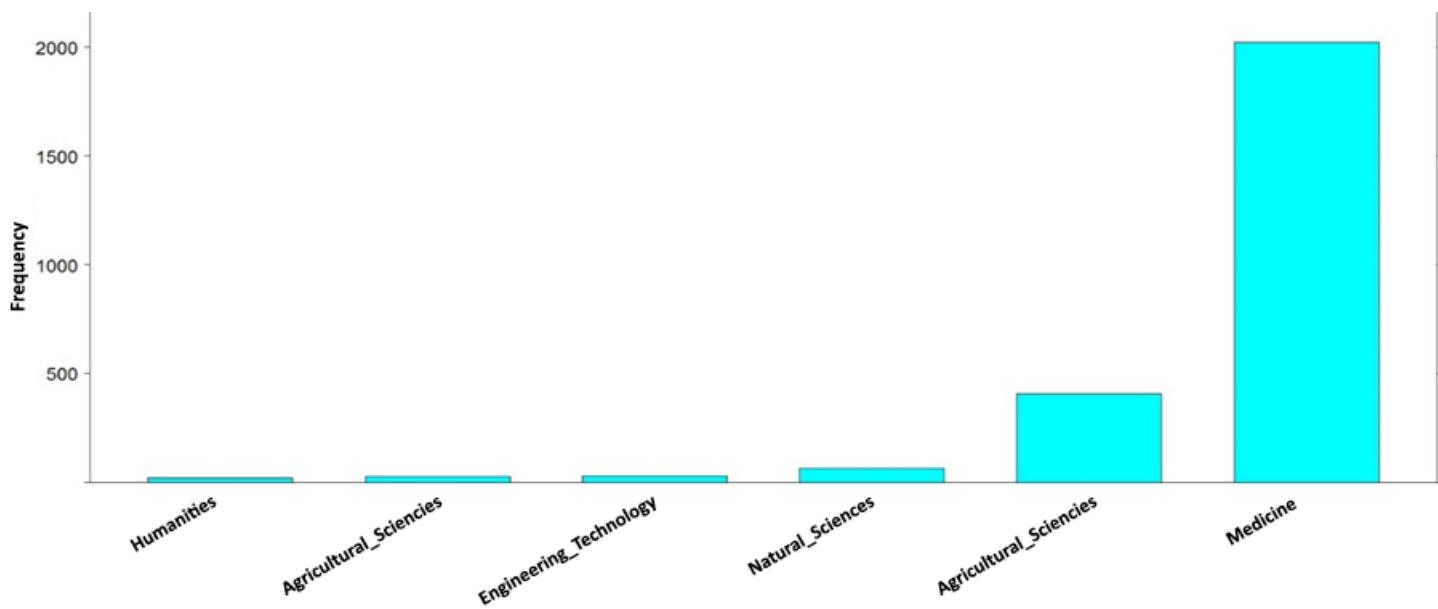


Figure 3. Scientific and technological areas in the postgraduate training of UNAN-Managua. Source: Presentation made by Rocha (June 20, 2017).

4. Organization for Economic Co-operation and Development (OECD) (2002. pp. 70-71).

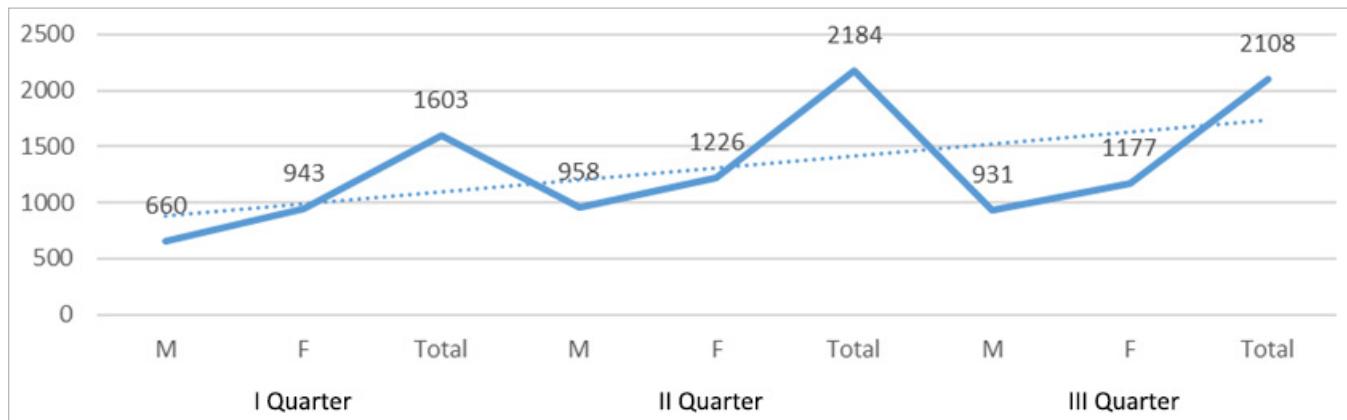


Figure 4. Graduate enrollment per quarter 2017. Sources: Physical-financial reports. I, II, III quarters 2017. Managua: UNAN-Managua.

Regarding equity in access, there is a predominance in the number of women who have entered the three quarters. The interesting thing about this is that, when comparing, it can be observed that the greatest desertion is occurring in the female sector (47 students 2%) in relation to the male (27 students 1%), taking as a reference the maximum number of students who have entered (II Quarterly).

The programs with the highest growth were masteries, followed by medical specialties (Table No. 1).

Table 1. Enroll per programme 2017

Study Program	I Quarter		II Quarter		III Quarter	
	C. Est	%	C. Est	%	C. Est	%
Masters	997	62%	1538	72.35%	1511	71.67%
Medical Specialties	306	19%	306	14.51%	306	14.51%
Total						

Sources: Physical-financial reports. I, II, III quarters 2017. Managua: UNAN-Managua.

Post-graduate retention at UNAN-Managua, to the second quarter of 2017 (considering the data provided by different units), is 88% and dropout can be considered low, about 12% (figure 5).

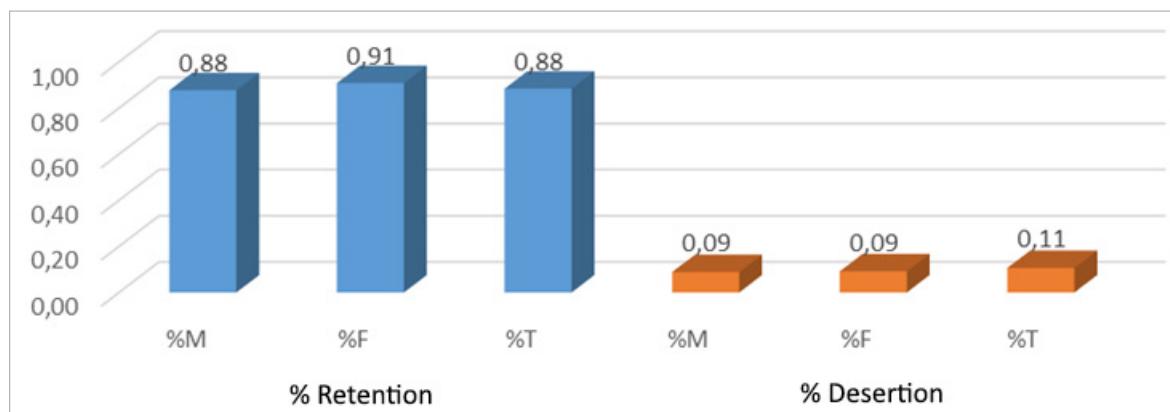


Figure 5. Retention and desertion II trimester (I semester) 2017. Source: DDP- UNAN-Managua.

In relation to the degree it is verified that until the third quarter of 2017, 421 students have graduated (Figure 6) indicating that at the end of the year a similar amount will be achieved as of 2016 (564 graduates)⁵.

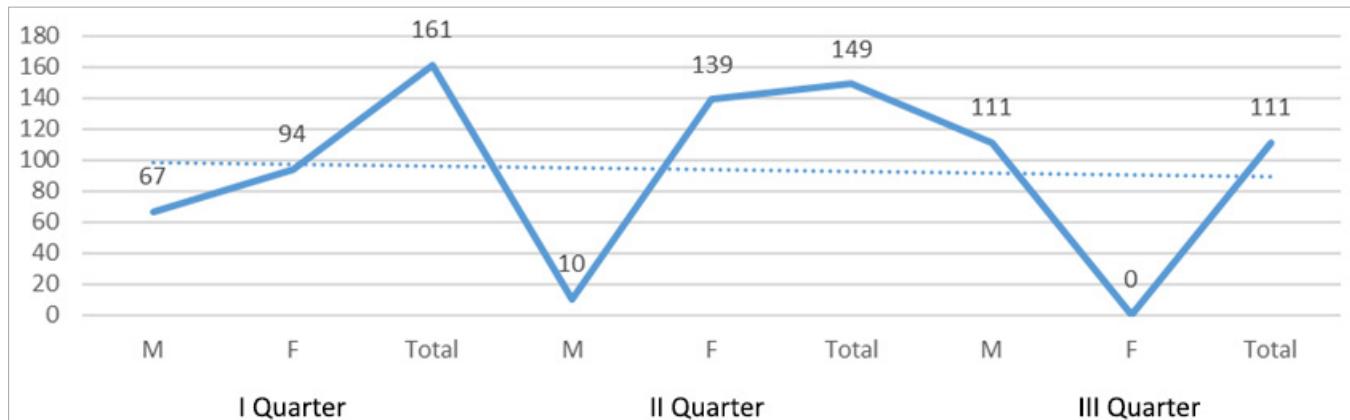


Figure 6. Graduate graduates by 2017 quarter. Physical-financial reports. I, II, III quarters 2017. Managua: UNAN-Managua.

The majority of graduates focus on masters (I quarter 33%, II quarter 50.34%, III quarter 66.66%), followed by medical specialties. (I quarter 96 graduates, II quarter 46.84%, III quarter 27%). In relation to the Doctorates, there are 96 graduates registered in the period.

3.3.3. Teaching and research

Through a recursive and dialectical process, teaching and research link both teachers and students with research projects. This, in turn, should generate the incorporation of the research results into the content of the teaching both in postgraduate and graduate, which transfers knowledge for the creation of tools for research. UNAN-Managua has invested in the training of its teachers and researchers.

The training of academic staff is one of the main priorities for UNAN-Managua. In figure 7, the number of teachers with postgraduate training can be corroborated. It is worth paying

5. Annual physical-financial report 2016 of the Unan-Managua.

attention, in the evolution of graduates with a Doctor degree, which has increased so much in the current period in relation to the year 2016: "10.41% of the academic staff of this study house has an academic level of doctor, which represents an increase of 68.42% in relation to the third quarter of 2016" (*Physical-financial report. III quarters, 2017*). This is important, but even this level of graduation is not being sufficiently exploited by their respective academic units.

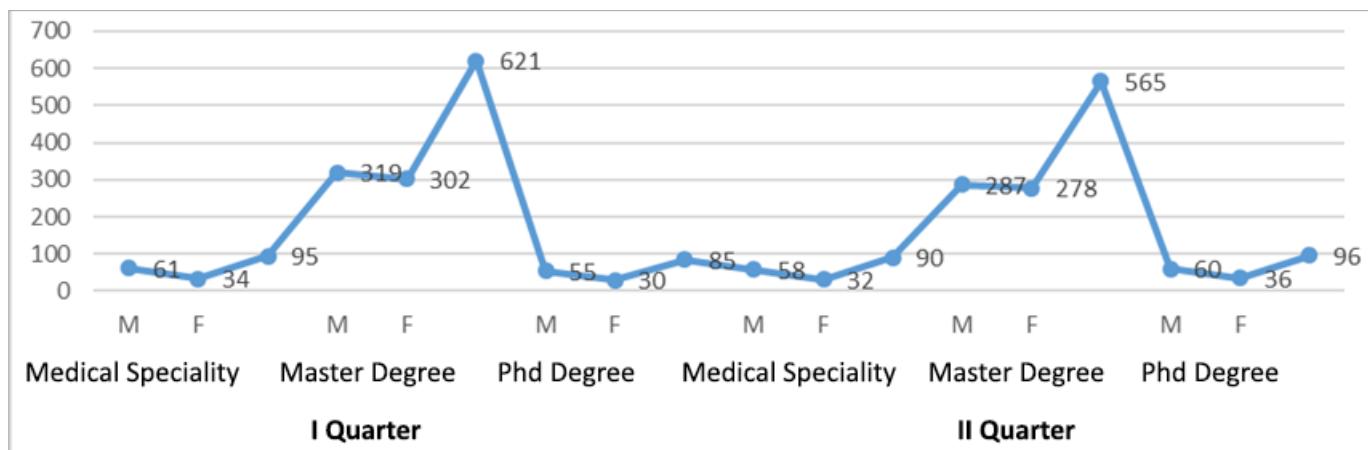


Figure 7. Degrees of Academic staff. Source: *Physical-financial reports. I, III quarters 2017*. Managua: UNAN-Managua.

Thus, a good number of doctors teach in the two subsystems, therefore, both are directly strengthened. However, productivity and the transfer of knowledge transformed into teaching, research, and technology tools are not yet visible in all areas and their effects are barely beginning to be felt in: the formation of research groups led by doctors, some projects of research and individual or joint publications, mainly, in the journals of the same institution.

The low productivity and the weak transfer of knowledge towards the subsystems, is observed in that the amount of thesis in process, is low in relation to the number of students enrolled and, at the same time this is reduced more, when comparing this same amount of Enrollment with theses completed in the period (graph N ° 8).

In relation to graduation and terminal efficiency, in the first case, the population of women is more than half of the graduates, which is adequate given its pre-registration enrollment. However, considering that 125 theses have finished their thesis in general (13% of the population of 944), it can be inferred that a little more than 60 women have successfully completed their postgraduate training. That is, the level of graduation is not only low in general but for the female gender it is very low in relation to the amount they enter the subsystem.

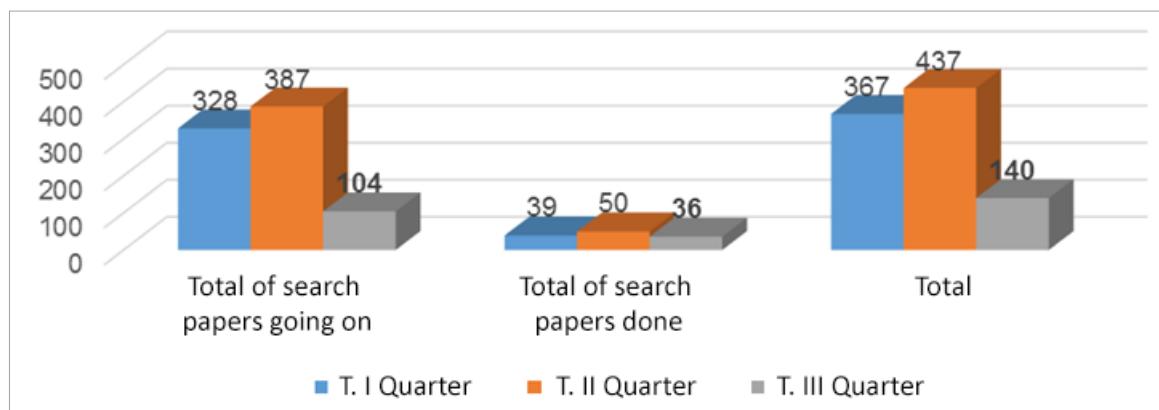


Figure 8. Postgraduate thesis. Source: Physical-financial reports. I, II, III quarters 2017. Managua: UNAN-Managua.

To develop the research, at present, there is a defined organizational structure, integrated by a Vice-Rectorate for Research and two research directions (one in degree and one in postgraduate). On the other hand, it has a series of physical and organizational structures with the capacity to develop it (table 2).

Table 2. Installed capacity for research	
Academic Unit	Total
Research Centers and Institutes	05
Investigation Groups	17
Central specialized laboratories	02
Stations and experimental farms	02
Specialized Units	04
Vice rectorate for Research	01
Research Directorate	02
Campus Research Commission	04
Research Coordination by Campus / Faculty / Center	10
Research council	04

Source: Physical-financial reports. I, II, III quarters 2017. Managua: UNAN-Managua.

From human capacities, according to the *physical-financial Reports. I, II, III quarters* (2017), there is a permanent teaching staff, aimed at promoting and developing the research training of students. That is, researchers focus their efforts on the training of students and not to develop research projects that raise the research level (production and transfer of knowledge), in the university.

Due to the work of rearrangement and specification of functions, which is promoted in the institution, a substantial reduction in the number of researchers in the third quarter of 2017 can be noticed (figure 9). In other words, the number of researchers reported in this period is 128, of which 24% have a doctor's degree and 73% have a master's degree. Of the population of researchers, 81 are women, which represents a high percentage (63%) of this sector's participation in this function.

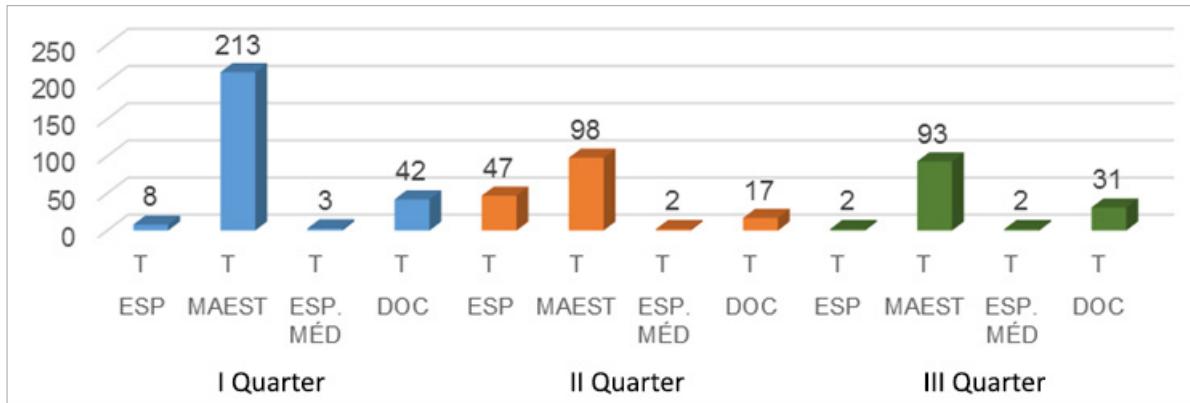


Figure 9. Researchers by the level of training. Source: Physical-financial reports. I, II, III quarters 2017. Managua: UNAN-Managua.

The research seeks to identify, explain, interpret and contribute to the solution of scientific and social problems. Considering the number of researchers (graph N ° 10), per quarter, the number of projects is not consistent with the results, due to two situations: the number of projects promoted by researchers⁶ is high (I quarter: 171 researchers, 86 projects, 5 completed, 81 in execution; II quarter: 174 researchers, 98 projects, 7 completed, 91 in execution; III quarter: 77 researchers 68 projects, 10 completed, 58 in execution), but their completion is low, if the projects are taken by quarter or as a whole (of 413 projects have only completed 22). The main areas in which the projects are developed are aquatic resources, biotechnology, medicine, education, among others. In the last quarter, there is a considerable decrease in the participation of researchers in research projects (98 in I quarter to 8 in III quarter).

6. In the information provided by physical-financial reports. I, II, III trimesters (2017), the teaching-research category -created in Statutes, UNAN-Managua (2014)- does not provide any data on this component.

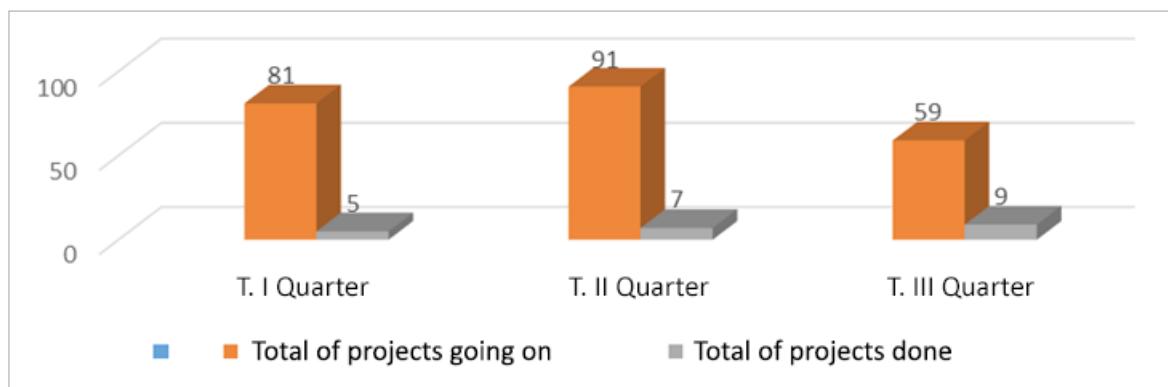


Figure 10. Researchs conducted by plant researchers. Source: Physical-financial reports. I, II, III quarters 2017. Managua: UNAN-Managua.

UNAN-Managua promotes the transfer of knowledge and teacher-student interaction through research. This component is in a similar situation to the previous one (graph No. 11). The number of projects is high (I quarter: 57 projects, 11 completed, 46 in execution; II quarter: 92 projects, 9 completed, 83 in execution; III quarter: 53 projects, 5 completed, 48 in execution), but their completion It is low, if the projects are taken per quarter or in their entirety (out of 202 projects, only 25 have been completed). The main areas in which the projects are developed are aquatic resources, humanities, and medicine.

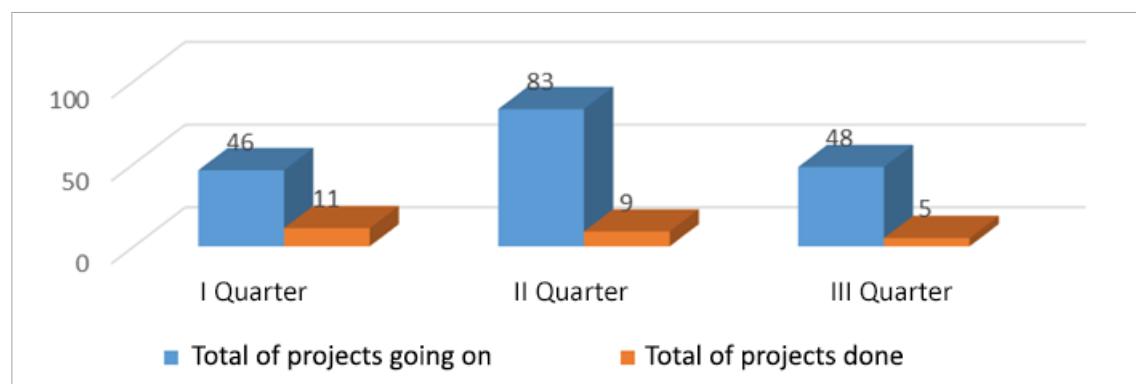


Figure 11. Research conducted by academics and graduate students. Source: Physical-financial reports. I, II, III quarters 2017. Managua: UNAN-Managua.

3.3.4. Mobility and internationalization

Internationalization is another function that the institution is driving strongly in this last biennium. For this, it has the necessary regulation, which extends, also at the graduate level. Academic and research mobility is one of the manifestations of this function. Thus, students and teachers, foreigners and nationals, can participate in internships and networks in the country or abroad respectively (Institutional Mobility Regulation, 2017).

At present, graduates of different programs have accessed higher-level postgraduate studies. At the same time, double degree agreements have been formed that allow the mobility of teachers and students (doctorates and masters). These experiences favor the institution, not

only the training of its staff but the opportunity to raise awareness of the quality of teachers it has, in the different programs. However, to obtain better performance and prestige, even graduate programs require better organization and international recognition.

4. CONCLUSIONS AND RECOMMENDATIONS

From each of the aspects addressed in this first part of the work it can be concluded:

- In its two phases of development, the postgraduate program at UNAN-Managua has gone from orientation to teacher training, to the training of scientists. This last aspect is the beginning of the third stage - consolidation, and modernization - which must be oriented to the ordering and development of research and innovation; in order to obtain an added value of the knowledge that is obtained from the critical mass that is being formed.
- The research areas developed by postgraduate studies are currently focused on medical sciences and social sciences. However, its impact is not being measured, therefore, it is necessary to initiate research to have objective knowledge of how it contributes to society and at what level it is being impacted. On the other hand, research is required to consider the feasibility of development that may have the areas of natural sciences, engineering and, technology and agricultural sciences.
- The issue of retention, promotion, qualification should be considered from the perspective of the effectiveness and efficiency of the programs because the last indicator is a measure of program quality. Therefore, it is necessary to initiate studies that indicate the reason or reasons for this traffic jam, and at the same time, create a strategy that allows reducing the low promotion and graduation rates.
- Teaching and research must go hand in hand, therefore, to the extent that there is greater integration between them through the creation of research groups within the programs, these will impact effectively in degree, in postgraduate (interdisciplinarity) and in the national reality.
- Postgraduate mobility and internationalization are gaining increasing dynamism. For the university to obtain greater revenues from this function, it is necessary to comply with the self-evaluation, evaluation, and accreditation of the programs. This will give impetus to them, on the issue of quality, which will be better considered from foreign demand. Therefore, not only will there be mobility abroad, but it will be able to receive students and teachers in the institution.
- Graduates, the supply and demand of postgraduate studies are neglected subjects in postgraduate. Therefore, starting studies in these will favor the approach with society

and private companies, which in turn will be an opportunity to measure the social impact of the postgraduate course developed at UNAN-Managua.

BIBLIOGRAPHIC

- Consejo Nacional de Evaluación y Acreditación Institucional. (2014). *Informe de verificación externa UNAN-Managua*. Managua: CNEA
- Consejo Nacional de Universidades. (2004). *Informe de posgrado CNU*. Managua: CNU.
- Consejo Nacional de Universidades. (2005). *Informe de posgrado CNU*. Managua: CNU.
- Consejo Nacional de Universidades. (2006). *Informe de posgrado CNU*. Managua: CNU.
- Consejo Nacional de Universidades. (2008). *Informe de posgrado CNU*. Managua: CNU.
- Consejo Nacional de Universidades. (2009). *Informe de posgrado CNU*. Managua: CNU.
- Consejo Nacional de Universidades. (2011). *Informe de posgrado CNU*. Managua: CNU.
- Consejo Nacional de Universidades. (2013). *Informe de posgrado CNU*. Managua: CNU.
- Consejo Nacional de Universidades. (2015). *Informe de posgrado CNU*. Managua: CNU.
- Escobar, A. (2017). *Retos del posgrado en la UNAN-MANAGUA y sus implicaciones en la sociedad nicaragüense*. Managua: UNAN-Managua.
- Lage, A. (2015). *La economía del conocimiento y el socialismo. Preguntas y respuestas*. Habana: Academia.
- Organization for Economic Co-operation and Development (OECD). (2002). *Manual de Frascati*. Madrid: Fundación Española para la Ciencia y la Tecnología.
- Rocha, L. (junio 20, 2017). Graduados en programas de maestría y ciencias médicas. Inscripción en registro académico. Serie de datos completa 2007-2015 (incluye abril 2016). Managua: UNAN-Managua.
- Tünnermann, C y Yarzábal, L, (2002). *Tendencias y potencialidades del desarrollo de la educación superior en Nicaragua*. Managua: Asdi.
- Universidad Nacional Autónoma de Nicaragua Managua, UNAN-Managua. (2011). *Reglamento del Sistema de Estudios de Posgrado y Educación Continua, SEPEC-UNAN-Managua*. Managua: UNAN-Managua.
- Universidad Nacional Autónoma de Nicaragua Managua, UNAN-Managua. (2017). *Plan operativo anual institucional, 2017*. Managua: UNAN-Managua.
- Universidad Nacional Autónoma de Nicaragua Managua, UNAN-Managua. (2017). *Plan de monitoreo, seguimiento y evaluación del Plan estratégico institucional 2015-2019*. Managua: UNAN-Managua.
- Universidad Nacional Autónoma de Nicaragua, Managua UNAN-Managua.

- (2017). *Informes físico-financieros. I, II y III trimestre 2017.* Managua: UNAN-Managua.
- Universidad Nacional Autónoma de Nicaragua, Managua UNAN-Managua. (agosto, 2017). *Informe, indicadores de investigación y posgrado de la UNAN-Managua solicitado por CSUCA (2016).* Managua: UNAN-Managua.
- Universidad Nacional Autónoma de Nicaragua, Managua UNAN-Managua. (2014). *Estatutos.* Managua: UNAN-Managua.
- Universidad Nacional Autónoma de Nicaragua, Managua UNAN-Managua. (2016). *Informe físico-financiero anual 2016 de la UNAN-Managua.* Managua: UNAN-Managua.
- Universidad Nacional Autónoma de Nicaragua, Managua UNAN-Managua. (2017). *Política de Investigación e Innovación, 2017.* Managua: UNAN-Managua