







## Master's degree academic education in the Faculty of Health Technology, year 2022

La formación académica de maestría en la Facultad de Tecnología de la Salud, año 2022

Susana Solis Solis <sup>1</sup> , Tomas David Verdecía González <sup>1</sup> , Estefany Pelladito Báez <sup>1</sup> , Yergenia Matute Gainza <sup>2</sup> , Marcia Evia Mesa Diaz <sup>2</sup> , Juan Carlos Páez Valdés <sup>1</sup> 

<sup>1</sup> Universidad de Ciencias Médicas de La Habana. La Habana. Facultad de Tecnología de la Salud, Cuba.

<sup>2</sup> Universidad de Ciencias Médicas de Santiago de Cuba. Facultad #1. Santiago de Cuba, Cuba.

**\*Corresponding author:**  
[susanasolis@infomed.sld.cu](mailto:susanasolis@infomed.sld.cu)

**Received:** January 24<sup>th</sup>, 2023  
**Accepted:** February 7<sup>th</sup>, 2023

### Cite as:

Solis-Solis S, Verdecia-González TD, Pelladito-Báez E, Matute-Gainza Y, Mesa-Diaz ME, Páez-Valdés JC. Master's degree academic education in the Faculty of Health Technology, year 2022. Revista Cubana de Tecnología de la Salud [Internet]. 2023 [cited:];14(1):4027. Available from: <http://www.revtecnologia.sld.cu/index.php/tec/article/view/4027>

### ABSTRACT

**Introduction:** postgraduate academic training aims to achieve high professional competence and advanced capabilities for specialized job performance, research, development and innovation. **Objective:** to characterize the master's degree academic training in the Faculty of Health Technology during the year 2022. **Method:** a descriptive cross-sectional study was carried out. The study universe consisted of the six master's degree programs developed at the Faculty of Health Technology in the year 2022. The following variables were studied: year of program approval, number of credits, duration, orientation, enrollment, edition, origin of the master's students and graduates. **Results:** there is an increasing trend in the number of programs approved at the institution, the number of credits per program varies from 67 to 80 credits, most of them have a duration of two years and are oriented to research assistance. The 66.7% are in the first edition, 90.3% of the master's students are from Havana and 55 professionals have graduated so far. **Conclusions:** the academic formation of master's degree in the Faculty of Health Technology is in correspondence with what is established by the postgraduate formation in Cuba and the pertinence demanded by the Cuban health system. It has a growing tendency in the approval of programs with an orientation towards assistance-research, which is evidenced in the development of a professional who contributes to raise the quality of the services offered to the population.

**Key words:** Academic training, Master's degree, Health Technology.

## RESUMEN

**Introducción:** la formación académica de posgrado tiene el propósito de lograr una alta competencia profesional y avanzadas capacidades para el desempeño laboral especializado, la investigación, el desarrollo y la innovación. **Objetivo:** caracterizar la formación académica de maestría en la Facultad de Tecnología de la Salud durante el año 2022. **Método:** se realizó un estudio descriptivo de corte transversal. El universo de estudio estuvo conformado por los seis programas de maestrías que se desarrollan en la Facultad de Tecnología de la Salud en el año 2022. Se estudiaron las variables: año de aprobación del programa, cantidad de créditos, tiempo de duración, orientación, matrícula, edición, procedencia de los maestrandos y graduados. **Resultados:** existe una tendencia creciente del número de programas aprobados en la institución, la cantidad de créditos por programas varía desde 67 hasta 80 créditos, la mayoría tienen un tiempo de duración de dos años y están orientados a la asistencia-investigación. El 66,7% cursan la primera edición, el 90,3% de los maestrandos son de La Habana y se han graduado hasta el momento 55 profesionales. **Conclusiones:** la formación académica de maestría en la Facultad de Tecnología de la Salud está en correspondencia con lo que establece la formación del posgrado en Cuba y la pertinencia que reclama el sistema de salud cubano. Tiene una tendencia creciente en la aprobación de programas con una orientación hacia lo asistencial-investigativo, que se evidencia en el desarrollo de un profesional que contribuye a elevar la calidad de los servicios que se ofrecen a la población.

**Palabras clave:** Formación académica, Maestría, Tecnología de la Salud.

## INTRODUCTION

The development of humanity, particularly in the systems of health protection and care, relies on the quality of teaching and learning processes (TLP) of human resources to ensure competent professionals for essential tasks. Continuous and ongoing education plays a significant role in improving the performance of healthcare professionals.<sup>1,2</sup>

Postgraduate education is one of the components of the continuous training model in higher education, ensuring the continuous advancement of university graduates. It enables specialization, reorientation, and updates while enriching cultural knowledge to better address present and future needs.<sup>1,2</sup>

The Ministry of Higher Education (MES) defines postgraduate academic training with the purpose of providing postgraduate education. This guarantees a high level of professional competence and advanced skills for specialized professional performance, research, development, and innovation.<sup>3</sup>

Among the forms of postgraduate advancement, the master's degree stands out, offering an extensive and advanced scientific culture in a specific area of knowledge. It enhances teaching, administrative tasks, research, innovation, and other activities related to professional performance, in line with the country's economic, social, scientific, technological, and cultural development.<sup>4</sup>

In Cuba, the development of human capital in health is based on continuous professional training with a scientific and humanistic vision. Scientific and technological research, innovation, and promotion are emphasized to build solutions for the National Health System's (SNS) problems, aligned with the sector's strategic objectives.

In the healthcare sector, postgraduate training processes contribute to improving the performance of professionals. These training processes are diverse and began shortly after the implementation of the SNS, although the academic figure represented by the Master's degree emerged later.<sup>5</sup>

The academic training provided by the Master's degree in the health sector is considered another option to meet the continuous professional training needs of healthcare professionals, addressing re-emerging and emerging service-related problems at any level of care.

Consequently, the curricular designs of the programs are based on the analysis of the pedagogical process, responding to social health needs, service provision, professional education, problem-solving, research, management, and the rational use of human and material resources.<sup>6</sup>

For this reason, the Faculty of Health Technology (FATESA), governed by Resolution 140 of 2019, the Postgraduate Regulation of the Republic of Cuba, is currently working on the development and implementation of Master's degree programs with a high level of scientific updates.

The Master's programs at FATESA aim to provide academic training for technologists and professionals in various areas related to the healthcare sector. It will enable scientific and innovative problem-solving within the context. Based on the aforementioned reasons, the authors aim to characterize the academic training provided by the Master's degree programs at the Faculty of Health Technology during the year 2022.

## METHOD

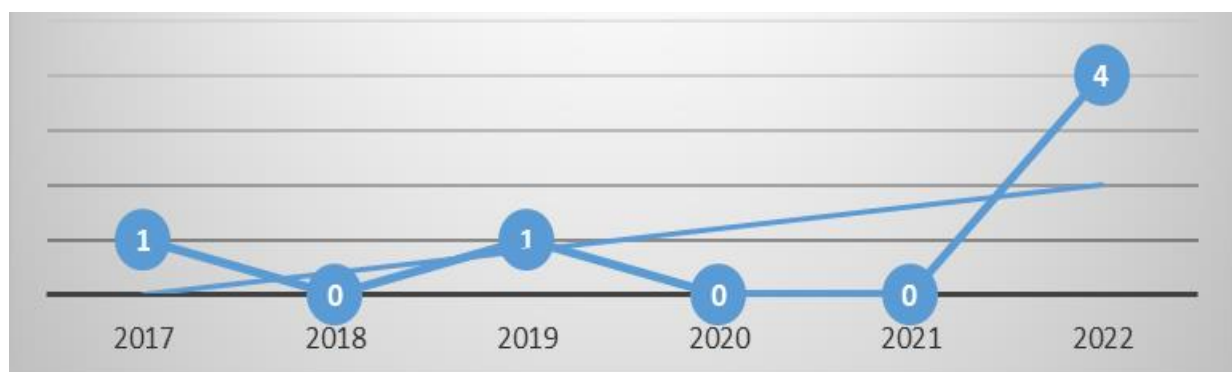
A descriptive cross-sectional study was conducted in order to characterize the academic master's programs at the Faculty of Health Technology during the year 2022. The study population consisted of the six master's programs offered at the Faculty of Health Technology.

The following variables were studied: year of program approval, credit count, duration time, focus, enrollment, edition, origin of students and graduates. To gather information, the curriculum designs of the six master's programs and statistical records of academic training were reviewed.

A database was created using Microsoft Excel 2019, allowing for data processing. The information was summarized in absolute and relative frequencies. The obtained results were presented in tables and graphs to aid visualization and comprehension of the study outcomes. Ethical standards of scientific research were maintained.

## ANALYSIS AND DISCUSSION OF RESULTS

Figure 1, illustrates the distribution of master's programs according to the year of approval at the Faculty of Health Technology. There is an evident increasing trend in the number of programs approved by the Ministry of Higher Education from 2017 to the present.



**Figure 1.** Distribution of Master's Programs According to Year of Approval. Source: Statistical records from the Department of Postgraduate and Research

An increase during 2022 is observed. The first approved program was Medical Imaging Technology in 2017, followed by Diagnosis and Therapeutics in Optometry and Optics in 2019. In 2022, the following programs were approved: Technological Procedures in Hygiene and Epidemiology, Applied Statistics and Data Sciences in Health, Management of Medical Supply in Pharmaceutical Services, and Technological Procedures in Neuromusculoskeletal Rehabilitation.

The master's program designs cater to Health Technologists and professionals in various areas of expertise related to the health sector. This is in line with the Ministry of Higher Education's consideration of the continuous education needs of graduates from broad-profile careers, necessary for the country's economic, social, scientific, technological, and cultural development.<sup>5</sup>

**Table 1.** Master's Programs According to Credit Count, Duration Time, and Focus. FATESA, 2022.

Programs	Credit Count	Duration Time	Focus or Orientation
Medical Imaging Technologies	80	2 years	Clinical-Research
Diagnosis and Therapeutics in Optometry and Optics	77	2 years	Clinical-Research
Technological Procedures in Hygiene and Epidemiology	68	1 year and 6 months	Clinical-Research
Management of Medical Supply in Pharmaceutical Services	80	2 years	Clinical-Research
Applied Statistics and Data Sciences in Health	80	2 years	Clinical-Research
Technological Procedures in Neuromusculoskeletal Rehabilitation	67	2 years	Clinical-Research

**Source:** Statistical Records from the Department of Postgraduate Studies and Research

Regarding credit count, duration time, and program focus, as shown in Table 1, the credit count varies from 67 to 80 credits across programs.<sup>7-12</sup> This aligns with the minimum requirement of 60 credits; the count and distribution depend on objectives, execution modality, profile peculiarities, and field of knowledge.<sup>5</sup>

Five programs have a two-year duration<sup>7-9, 11, 12</sup>, while the Hygiene and Epidemiology Technological Procedures<sup>10</sup> extend to one year and six months. Edition duration can extend up to three years, determined by dedication modes, resource availability, methodology, and student characteristics.<sup>6</sup>

All master's programs at FATESA are oriented toward assistance and research.<sup>7-12</sup> These respond to growing demands for professionals who enhance, deepen, complete, and reorient their performance, meeting contemporary labor requirements for the country's development.

Experiences from other regions, such as the European Union's programs under the Bologna agreements, facilitate employability, mobility, and recognition of university degrees. Latin American countries like Mexico, Costa Rica, Brazil, Colombia, Argentina, and Chile also exhibit similar trends.<sup>13</sup>

In general, a wide diversity of degrees is observed, with two main types: academic, focusing on research profiles; and professional, developing specific professional capabilities.<sup>13</sup> These orientations expand based on core activities: research, assistance-research, teaching-research, or administration-research.

These novel guidelines constitute innovative additions to the curricular frameworks of master's degree programs, founded upon postgraduate regulations. Here, the notion of academic credit holds significance, in conjunction with contemporary trends in the pursuit of academic excellence at the highest echelons.<sup>6</sup>

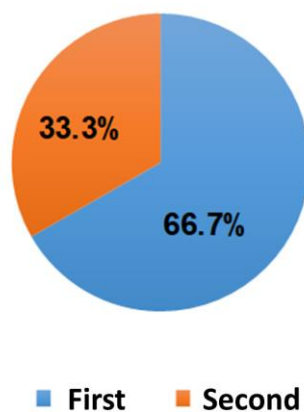
Incorporating research is essential in curricula for assistance, teaching, or administration-oriented programs. Failing to do so would contradict the academic nature of Cuban postgraduate education, reducing it to professional programs meant to develop specific skills.<sup>14</sup>

**Table 2.** Enrollment Distribution by Master's Programs. FATESA, 2022.

Programs	Enrollment	%
Medical Imaging Technologies	28	14,2
Diagnosis and Therapeutics in Optometry and Optics	30	15,2
Technological Procedures in Hygiene and Epidemiology	34	17,2
Management of Medical Supply in Pharmaceutical Services	32	16,2
Applied Statistics and Data Sciences in Health	38	19,3
Technological Procedures in Neuromusculoskeletal Rehabilitation	35	17,8
Total	197	100

Enrollment distribution, as shown in Table 3, highlights increased demand for programs approved in 2022. This corresponds to the limited availability of master's or specialty programs for professionals in Health Technologies.

Engaging in these academic processes enables the acquisition of novel knowledge, facilitates exchange, and fosters the assimilation of best practices, which in turn engender prospective collaborations and interinstitutional networks. The firsthand experiences and professional expertise of those involved in these processes hold a pivotal role within the manifold exchanges they give rise to.<sup>15</sup>



**Figure 2.** Distribution of Master's Programs by Edition. FATESA, 2022.

**Source:** Statistical Records from the Department of Postgraduate Studies and Research

A total of 66.7% of the master's programs conducted at FATESA are currently in their inaugural edition. The master's program in Imaging Technology and Diagnosis, as well as Therapeutics in Optometry and Optics, is presently in its second edition, constituting 33.3% of the editions. Refer to Figure 2.

The term "edition" refers to the implementation of a master's program within a specific timeframe, aligned with the stated duration, and considering the potential formation of multiple cohorts. Each edition is accompanied by an academic calendar, detailing the commencement date; the schedule encompasses key activities outlined in the curriculum and

designates the edition's closure date. Editions are numerically designated based on their initiation date.<sup>1, 16, 17</sup>

**Table 3.** Origin of Master's Students by Master's Programs. FATESA, 2022.

Programs	Havana		Otras provincias		Total	
	No.	%	No.	%	No.	%
Medical Imaging Technologies	28	100	0	0	28	100
Diagnosis and Therapeutics in Optometry and Optics	26	86,7	4	13,3	30	100
Technological Procedures in Hygiene and Epidemiology	34	100	0	0	34	100
Management of Medical Supply in Pharmaceutical Services	32	100	0	0	32	100
Applied Statistics and Data Sciences in Health	33	86,4	5	13.2	38	100
Technological Procedures in Neuromusculoskeletal Rehabilitation	25	71,4	10	28.6	35	100
Total	178	90,3	19	9.6	197	100

**Source:** Statistical Records from the Department of Postgraduate Studies and Research

Regarding student origins, the majority (90.3%) are from Havana, with only 9.6% from other provinces. This correlates with the lack of accommodation at FATESA and the limitations posed by the COVID-19 pandemic, hindering professionals' mobility to join academic programs.

FATESA, as the Central Methodological Authority for Health Technologies, is intentionally working towards including master's programs for interested professionals across the country. The academic programs are unique and uniformly implemented.<sup>18, 19</sup>

**Table 4.** Graduates Distribution by Master's Programs. FATESA, 2022.

Master's programs	No.	%
Medical Imaging Technologies	22	40.0
Diagnosis and Therapeutics in Optometry and Optics	33	60.0
Technological Procedures in Hygiene and Epidemiology	0	0
Management of Medical Supply in Pharmaceutical Services	0	0
Applied Statistics and Data Sciences in Health	0	0
Technological Procedures in Neuromusculoskeletal Rehabilitation	0	0
Total	55	100

**Source:** Statistical Records from the Department of Postgraduate Studies and Research

The number of graduates from FATESA's master's programs reveals that 55 professionals have graduated so far. Imaging Technology has produced 22 (40.0%) graduates, and Diagnosis and Therapeutics in Optometry and Optics has produced 33 (60.0%). Other programs are still in their first edition.

Completing a master's program in the health field contributes to comprehensive and multilateral professional development, fostering spiritual functions of varying degrees of complexity and organization.<sup>5, 20</sup> FATESA's academic training contributes to scientific culture,<sup>5, 20</sup> investigating risk factors influencing postgraduate education and health-related science, technology, and innovation in Cuba.

Advanced knowledge in a specific area fulfills assistance, research, teaching, and autonomous roles with creativity, integrity, and human values, resulting in relevant and high-quality professional performance.<sup>5, 20</sup>

## CONCLUSIONS

The academic master's programs at the Faculty of Health Technology align with Cuba's postgraduate education guidelines and the relevance demanded by the Cuban health system. A growing trend is observed in approving programs oriented towards assistance and research, fostering professionals who enhance the quality of services provided to the population.

## REFERENCES

1. Valdés-Roque Y, González-Ponce de León RS, López-Suárez A, Salazar-Duany Z, Cívico-Montero H. La formación académica en salud reflejada en los egresados de la ELAM y su vínculo con la teoría Educación Avanzada. *Panorama Cuba y Salud* [internet] 2018[citado 2022 nov 22];13 (Especial): 318-321 Disponible en: <https://revpanorama.sld.cu/index.php/panorama/article/view/1027>
2. García-Salas JM, Rodríguez-Día JL, Parcon-Bitanga M. Formación de posgrados en Enfermería, una necesidad para Santo Domingo de los Tsáchilas .AMC Camagüey [internet] 2019[citado 2022 nov 22]; 26(5):[aprox 9 p]. Disponible en: <https://revistaamc.sld.cu/index.php/amc/article/view/6529>
3. González-Hernández E, Isaza-Gómez GD, Miranda-Calderón K, Mosquera-Vente AM. Panorama de la formación de posgrado para el área educación física, deporte, actividad física, recreación y afines en Colombia. *Revista Digital: Actividad Física y Deporte*. [internet] 2022[citado 2022 nov 22]; 8(2): [aprox 9 p]. Disponible en: <https://revistas.udca.edu.co/index.php/rdafd/article/view/2207>
4. Ministerio de Educación Superior MES. Reglamento de educación de posgrado de la República de Cuba. Resolución 140 de 2019 de Ministerio de Educación Superior. La Habana, Cuba: Gaceta Oficial de la República de Cuba [internet] 2019 [citado 2023 enero 22];1440-1452: Disponible en: <https://www.gacetaoficial.gob.cu/es/resolucion-140-de-2019-de-ministerio-de-educacion-superior>
5. Roque-González R, Guerra-Bretaña RM, Brito-Álvarez G, Anido-Escobar V. Factores de riesgos que influyen en el desempeño del proceso de formación de posgrado Educ Méd Super. [internet] 2020 [citado 2023 enero 22];34(1). Disponible en: [http://scielo.sld.cu/scielo.php?script=sci\\_abstract&pid=S086421412020000100009](http://scielo.sld.cu/scielo.php?script=sci_abstract&pid=S086421412020000100009)
6. Bernaza-Rodríguez GJ, Douglas-De la Peña C, Orama-Domínguez I, González-Betancourt E, Dumé-Sánchez JA, Pausa-Carmenates MM. Diseño curricular de programas de maestría para profesionales de la salud. *Educ Méd Super* [internet] 2022[citado 2022 nov 22];36(4). Disponible en: <https://ems.sld.cu/index.php/ems/article/view/3635>
7. Ministerio de Salud Pública (MINSAP). Universidad de Ciencias Médicas de La Habana. Facultad de Tecnología de la Salud. Programa de la maestría en Estadística Aplicada y Ciencia de Datos en Salud. La Habana 2022.
8. Ministerio de Salud Pública (MINSAP). Universidad de Ciencias Médicas de La Habana. Facultad de Tecnología de la Salud. Programa de la maestría en Tecnologías de las Imágenes. La Habana 2022.
9. Ministerio de Salud Pública (MINSAP). Universidad de Ciencias Médicas de La Habana. Facultad de Tecnología de la Salud. Programa de la maestría en Diagnóstico y Terapéutica en Optometría y Óptica. La Habana 2022.
10. Ministerio de Salud Pública (MINSAP). Universidad de Ciencias Médicas de La Habana. Facultad de Tecnología de la Salud. Programa de la maestría en Procederes Tecnológicos en Higiene y Epidemiología. La Habana 2022.
11. Ministerio de Salud Pública (MINSAP). Universidad de Ciencias Médicas de La Habana. Facultad de Tecnología de la Salud. Programa de la maestría en Gestión del Suministro Médico en los Servicios Farmacéuticos. La Habana 2022.
12. Ministerio de Salud Pública (MINSAP). Universidad de Ciencias Médicas de La Habana. Facultad de Tecnología de la Salud. Programa de la maestría en Procederes Tecnológicos en Rehabilitación Neuromusculoesquelética. La Habana 2022.
13. Ministerio de Educación Superior. Dirección de Educación de Posgrado DEP. Instrucción No. 01/2020. Manual para gestión del posgrado. La Habana: MES; 2020. p. 1-48.

14. Bernaza-Rodríguez GJ, Dumé-Sánchez JA, Orama-Domínguez I, Jiménez- Sánchez L, Douglas de la Peña C, Alemañy-Pérez E, Orientaciones de las maestrías para profesionales de la salud, *Educ Méd Super.* [internet] 2022 [citado 2022 oct 12];36(3):1-18: Disponible en: <http://www.ems.sld.cu/index.php/ems/article/view/3374>
15. Bernaza-Rodríguez GJ, De la Paz-Martínez E, Del Valle-García M, Borges- Oquendo LdC. La esencia pedagógica del posgrado para la formación de profesionales de la salud: una mirada teórica, crítica e innovadora. *Educ Méd Super.* [internet] 2017 [citado 2023 ene 12];31(4):1-15. Disponible en: [http://scielo.sld.cu/scielo.php?script=sci\\_arttext&pid=S086421412017000400020&nrm=iso](http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S086421412017000400020&nrm=iso)
16. Bernaza-Rodríguez GJ, Aparicio-Suárez JL, De la Paz-Martínez E, Torres-Alfonso AM, Alfonso-Manzanet JE. La educación de posgrado ante el nuevo escenario generado por la COVID-19, *Educ Méd Super.* 2020 [citado 2022 oct 12]; 34(4): 4-6 Disponible en: [http://scielo.sld.cu/scielo.php?script=sci\\_arttext&pid=S0864-21412020000400015](http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S0864-21412020000400015)
17. Universidad Central "Marta Abreu" de Las Villas. Dirección de Educación de Postgrado. Procedimientos del Proceso Sustantivo de Formación de Másteres y Especialistas de Postgrado, Santa Clara [internet] 2021. [citado 2022 oct 12] Disponible en: <https://www.uclv.edu.cu/wpcontent/uploads/2022/06/UCLV>
18. Rodríguez-González N, Almaguer-Pérez NA, García-Arias JM. Formación de posgrado en Extensión Agraria: experiencias en Holguín, Cuba, *Revista iberoamericana de educación superior.* [internet] 2021 [citado 2022 oct 12];12(33): 158-178. Disponible en: <https://www.redalyc.org/journal/2991/299166154009/html/>
19. Linares-Sosa EY, Sosa-Sánchez TM, Cardoso-Camejo I. La formación profesional desde la visión de la Teoría de la Educación Avanzada. *Panorama Cuba y Salud* 2022 [citado 2023 ene 12];17(3): 2-13 Disponible en: <https://revpanorama.sld.cu/index.php/panorama/article/view/1500>
20. Pérez-Carreras A, Rojo-Pérez N, Morales-Suárez IR. Ciencia, tecnología e innovación para la salud en Cuba. La Habana: Editorial Ciencias Médicas [internet] 2022. [citado 2023 ene 12] Disponible en: <http://www.bvscuba.sld.cu/libro/ciencia-tecnologia-e-innovacion-para-la-salud-en-cuba>

## AUTHOR CONTRIBUTIONS

**Susana Solís Solís:** Conceptualization, writing, formal analysis, supervision, Writing - original draft, Writing – review and editing.

**Tomas David Verdecia González:** Conceptualization, data curation.

**Estefany Pelladito Báez:** Data curation.

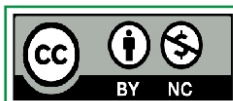
**Yergenia Matute Gainza, Marcia Evia Mesa Diaz, and Juan Carlos Páez Valdés:** Validation, Writing – review and editing.

## FUNDING

No funding was received for the development of this study.

## CONFLICTS OF INTEREST

No conflicts of interest are declared.



Los artículos de **Revista Cubana de Tecnología de la Salud** se compar-  
ten bajo los términos de la Licencia **Creative Commons Atribución-No  
Comercial 4.0. Internacional**