

Descriptive Analysis of University Enrollment Trends in Colombia between 2014 and 2022

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Abstracts: During the study period between 2014 and 2022, a 9.5% increase in the number of university students enrolled in Colombia was observed, with a total of 419,940 new enrollees. The objective of this research was to analyze trends and cycles in university enrollments, focusing on the impact of the COVID-19 pandemic and the growth of the virtual modality. The methodology included analyzing data from the National Higher Education Information System (SNIES) and performing calculations to evaluate variations in enrollments over the years. The results allowed visualizing the enrollment cycles between private and official sector universities, highlighting that the pandemic generated a significant decrease in enrollments in 2020, mainly affecting private universities. An increase in the gap between enrollment in the official and private sector was observed, with the latter losing ground. The virtual modality experienced exponential growth in the last 8 years and as a result of the pandemic became an important factor in the university enrollment market, especially in graduate programs in the private sector and undergraduate programs in the formal sector. In summary, the study reveals the transformation of the university enrollment landscape in Colombia, due to changes in student preferences between sector and mode of study. These findings may be valuable for decision making in educational institutions and provide a deeper understanding of trends in higher education in the Colombian context.

Keywords: Educational Administration; University, Enrollment, Higher Education, Economics of Education.

1. INTRODUCTION

Higher education in Colombia has undergone a period of remarkable transformations during the study period from 2014 to 2022. During this time, a 9.5% increase in the number of university students enrolled has been observed, with an increase of 419,940 new students. This article delves into the analysis of these trends and cycles in college enrollments, with a particular focus on the influence of the COVID-19 pandemic and the growth of the virtual modality.

In order to carry out this research, a methodology based on a quantitative approach was employed, which included the analysis of secondary data available in Colombia's National Higher Education Information System (SNIES). This process involved a series of crucial steps, from the collection of data related to university enrollments to their detailed analysis. The segmentation of the data allowed for an in-depth study of specific trends, such as the evolution of enrollments according to study modality, type of training and sector of institutions.

The results of this study revealed a set of striking findings. Cyclical behavior was identified in university enrollments by sector, with official and private institutions competing in terms of enrollment. This pattern of behavior shed light on the importance of understanding the dynamics of the educational market and the need to adapt to changing student preferences.

One of the most significant findings was the impact of the COVID-19 pandemic on university enrollments. In 2020, a significant decline was observed due to the transition of academic activities to virtual mode and general uncertainty. This impact disproportionately affected private universities, resulting in a notable gap between the formal and private sectors.

In addition, the exponential growth of the virtual modality was highlighted, which became an increasingly preferred study option for students. This change was particularly evident in the private sector and in graduate programs.

In terms of the gap between sectors, a change in the dynamics of the educational market was observed, as official universities surpassed private universities in terms of enrollment, both at the undergraduate and graduate levels.

In summary, this study provides a comprehensive view of the evolution of university enrollments in Colombia and underscores the need to adapt to changing student preferences and educational market conditions. The results of this research provide valuable information for decision making in educational institutions and a deeper understanding of trends in higher education in the Colombian context.

2. BACKGROUND

Higher education in Colombia has been the subject of in-depth scrutiny and analysis, both in academia and in the field of public policy, in order to understand its evolution and the challenges it faces. This interest is not limited to Colombia alone, but extends to all of Latin America, highlighting the importance of the region in the context of MERCOSUR (Alvarez, et al., 2022).

Within the Colombian context, the National Higher Education Information System (SNIES) has played a key role in providing essential information on enrollment in higher education in the country (Laboratorio de Economía de la Educación, 2022). Through this system, a significant increase in undergraduate enrollment has been identified, especially in the official sector, during the year 2021. This increase has been attributed to various factors, such as higher education access programs and the adaptation to the distance learning modality, motivated by the COVID-19 pandemic. However, it is important to note that, despite these changes, enrollment has not yet recovered to pre-pandemic levels, underscoring the complexity of the dynamics of Colombian higher education. This analysis has also been mentioned in recent reports to the submission of this article by the Colombian Ministry of National Education (2023).

Research has also delved into graduate programs in Colombia, and the Colombian Graduate Network (2023) has provided valuable insight into the supply and operation of these programs, as well as student and faculty trends. In addition, investment in science, technology and innovation and the employment situation of graduates have been analyzed, contributing significantly to the understanding of higher education in Colombia.

The impact of the demographic transition in Colombia and its influence on university enrollment has been addressed in studies by Roca and Granger (2021). Through the analysis of census data and access test records, a decrease has been detected both in the size of the cohorts of students entering and completing high school and in the demand for higher education. This decrease has been related to the reduction of fertility in Colombia and emphasizes the importance of understanding demographic dynamics in the context of higher education.

In addition, the demand for university education in Colombia has been approached from a microeconomic perspective in studies conducted by Verdú, Espitia and Mora Rodríguez (2013). These investigations have highlighted the importance of factors such as gender, parents' educational level, employment status, family composition and income in the demand for higher education, highlighting their role in the equality of educational opportunities and their relevance in the formulation of effective educational policies. As well as in the work of García (2019) has analyzed the implementation of the public policy "Ser Pilo Paga" in Colombia and highlighted its impacts and contradictions. Highlighting how this policy has influenced the distribution of state resources between public and private institutions, which has led to challenges in the financing of higher education.

The COVID-19 pandemic has had a significant impact on higher education in Latin America, including Colombia. As Pirela-Espina (2022) points out, the digital divide has emerged as a crucial challenge, affecting both students and facilitators. Educational institutions have been forced to adapt to the virtual modality, which has generated new demands and challenges in the quality of university education in the Latin American context. This transformation from face-to-face to distance education has also had an impact on the experience of university students in Colombia, as addressed in the research of Velandia Sedano (2021). This transition has accentuated the gaps in access to technological resources and digital educational strategies, underscoring the importance of technological

infrastructure in higher education.

In addition, the management of universities in Colombia during the COVID-19 pandemic has been the subject of study, and the strategies and practices adopted by the institutions have been analyzed, as detailed by Bedoya-Dorado, Murillo-Vargas & González-Campo (2021). Universities have implemented strategies to address teaching, research and outreach, in addition to supporting the country in the management of the pandemic. On the other hand, Quintero Leguizamon (2020) has investigated the crisis of public higher education in Colombia, aggravated by the arrival of Covid-19, and has examined how neoliberal measures implemented since the 1990s have contributed to the privatization of public higher education.

The decline in demand for higher education in Colombia and its causes have been explored in the study by Rincón Quiñones and Espitia Suárez (2021). Socioeconomic and financial factors, such as the decline in family income and the increase in the cost of university programs, have been identified as contributing to this decline in demand. The reduction in educational credits administered by ICETEX has also influenced this trend. These studies highlight the importance of understanding the dynamics in Colombian higher education in the midst of the pandemic and the policies implemented. However, there are additional related effects as mentioned by Chaves Campo, C. F., Muñoz Bonilla, H. A., & González Guacaneme, G. (2021) who identify the environmental factors of student learning, the methodology adopted by teachers and institutional actions, in a positive correlation with the decision of academic continuity. The results contribute to estimate a dropout rate for the second semester of 2020, and identify its behavior disaggregated in the educational population and other intervening variables.

Now, the challenges of university planning in the context of the current crisis have been explored in the research of González and collaborators (2021). Where it is illustrated how universities have faced socio-cultural and economic tensions, which makes necessary the development of coherent and relevant educational and planning models to address the realities of the country. Institutional planning plays a fundamental role in guiding change processes in an environment characterized by uncertainty and global crisis. In this sense, Espinal, Scarpetta and Cruz (2020) have provided an educational foresight framework that analyzes alternative futures in higher education institutions, focusing on the case of the Institución Universitaria Escuela Nacional del Deporte (IU END) in Valle del Cauca, Colombia. The study has developed four future scenarios that have important strategic implications.

The above-mentioned background studies provide a detailed overview of higher education in Colombia, ranging from the evolution of enrollment to the impact of the pandemic and educational policies. These studies are fundamental to understand the trends in higher education and underline the importance of rethinking strategies and policies in the education sector in Colombia. In coherence with these studies, the following is proposed as a descriptive analysis of student enrollment that is simple, objective and provides clear information for the education strategy.

2.1 Methodology

The methodology implemented in the article for obtaining the results and analysis was based on a quantitative approach involving the analysis of secondary data available in the Colombian National Higher Education Information System (SNIES). The key steps of the methodology included:

Data Collection: Data related to university enrollments in Colombia were collected for the study period from 2014 to 2022. These data included information on the number of students enrolled, the modality of study (face-to-face, distance, virtual), the type of training (undergraduate, graduate), and the sector of the institutions (official, private).

Data Analysis: Quantitative data analysis was conducted using specialized statistical software, such as Excel or statistical software, to calculate variations in enrollment over time. Growth rates, percentage differences were calculated and graphs and tables were generated to visualize patterns and trends in the data.

Data segmentation: Data were segmented to analyze specific trends, such as the evolution of enrollments by mode of study (face-to-face, distance, virtual), by type of education (undergraduate, graduate) and by sector of the

institutions (official, private).

Comparison and Contrast: Data from different years and segments were compared to identify significant differences and trends over the study period. Differences between the official and private sectors were examined, as well as between study modalities.

Interpretation of Results: The results were interpreted in light of the research objectives, focusing on the impact of the COVID-19 pandemic and the growth of the virtual modality on university enrollments.

Statistical analyses and trend calculations provided key information to understand how university enrollments in Colombia evolved over time and how the pandemic affected this phenomenon. These results were used to support the conclusions of the study and provide a solid picture of trends in higher education in the Colombian context.

The result of this analysis are 7 figures and tables that are presented in the results and analysis section.

3. RESULTS AND ANALYSIS

During the study period from 2014 to 2022, it is observed in the first graph of Figure 1, an increase of 9.5% in the number of university students enrolled in Colombia from 4'397,684 to 4'817,624 for a total of 419,940 new enrollees in 8 years. Within this period, the behavior of enrollment in Colombia illustrates a cyclical path of annual periodicity. Where the largest increase in enrolled students (295,019 a growth of 6.7%) occurs in the first three years of the period analyzed (2014 to 2017), followed by a decrease in enrollments (15,846 a decrease 0.3%) between 2018 and 2019, mostly affecting private universities. But the covid-19 phenomenon generated a larger drop in enrollments in 2020 (182,650 a 3.9%) and increased the gap between private and official universities' enrollments.

Analyzing the period prior to the pandemic, official and private universities followed a cyclical path overlapping each other, these distances maintained a moderate difference that did not exceed two digits. This can be visualized in the second graph in Figure 1, the jump between 2014, where official enrollments (2'259,596) exceed private enrollments (2'138,088) by 6%, and 2022, where official enrollments (2'584,552) exceed private enrollments (2'233,072) by 16%. And in the change of cycle between 2014 and 2022, analyzing from 2014 to 2015 the official enrollments surpassed the private ones by 6% and 3% respectively, then the cycle changes where the private ones surpassed the official ones between 2016 and 2017 by 4% and 2% respectively, and from 2018 begins a new cycle where the enrolled in official universities are superior to the private ones in 2019 with a difference level of 1%, to 2020 of 4%, 2021 of 17% and finally 2022 reflects a difference level of 16%.

The above, without distinguishing between undergraduate and graduate enrollments, shows how the enrollments of Colombian universities in 2020 have a significant drop in the study period due to the impact of covid-19, harming private universities to a greater extent, notably distancing the market share of general university enrollments, allowing official universities to gain the largest share over private universities. In this sense, as of 2020, official universities stand out as the main drivers of national enrollments, as illustrated in the last graph in Figure 1, which superimposes national (Colombia= National= Overall total), private and official (public) enrollments.

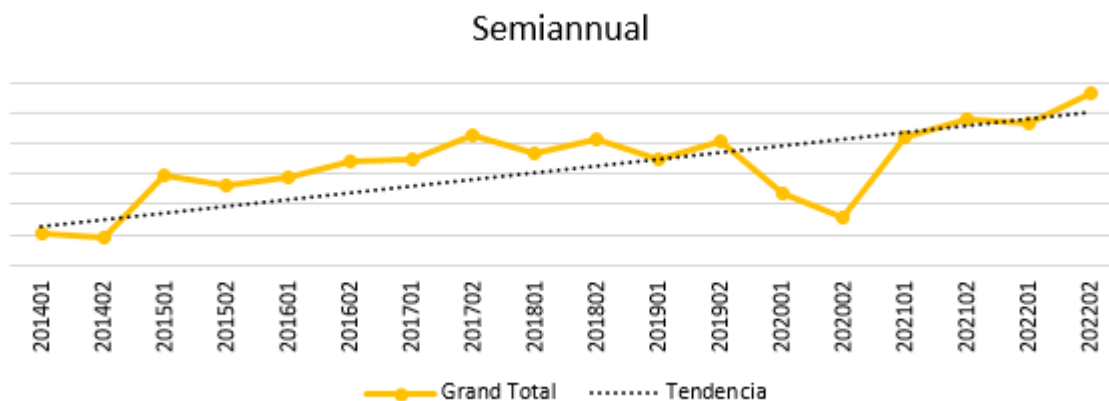


FIGURE 2. Semester University Enrollments In Colombia Between 2014 And 2022

Note: Based on SNIES data.

Table 1. Overall Impact on Enrollment from the pandemic between 2019 and 2021.

Period		Impact of Pandemic 2020	
Initial	Final	Variation	Magnitude
201902	202002	-5,4%	- 126.394
202002	202101	6,0%	132.783
202002	202102	7,4%	163.745
201902	202102	1,6%	37.351

On the other hand, the impact of the pandemic and the period of study is reviewed distinguishing the enrollments by the private and official sectors of the universities in Figure 3. It is visualized how the enrollments of the sectors are cyclical with reference to their previous semester and counter cyclical between sectors since 2015, when a sector increases in enrollments in the first semester the other sector decreases. In the case of the private sector its upward cycle is in the first semesters of each year while the official ones have it in the second semester and the downward cycles are the opposite semesters respectively. The pandemic scenario occurs in the middle of the first semester so that the strong effects on enrollment are visualized in the second semester of 2020 where official universities have their upward cycle and private universities have their downward cycle. In this sense, the enrollment cycles by sector intensified the effect on the losses in the private universities and cushioned those of the official sector. In the case of the private sector, it assumed most of the loss of students with an impact of 8.5%, while the official sector had an impact of 2.4%, as shown in Table 2. However, although the overall growth of enrollment to 2021 is 1.6% higher than in 2019, only the official sector has surpassed pre-pandemic levels by 8.8%, despite the fact that the private sector is growing in enrollment, it has not yet recovered pre-pandemic levels of enrollment (-6.6% in the second semester of 2019) and has generated an enrollment gap between university sectors (see Table 2 and Figure 3).

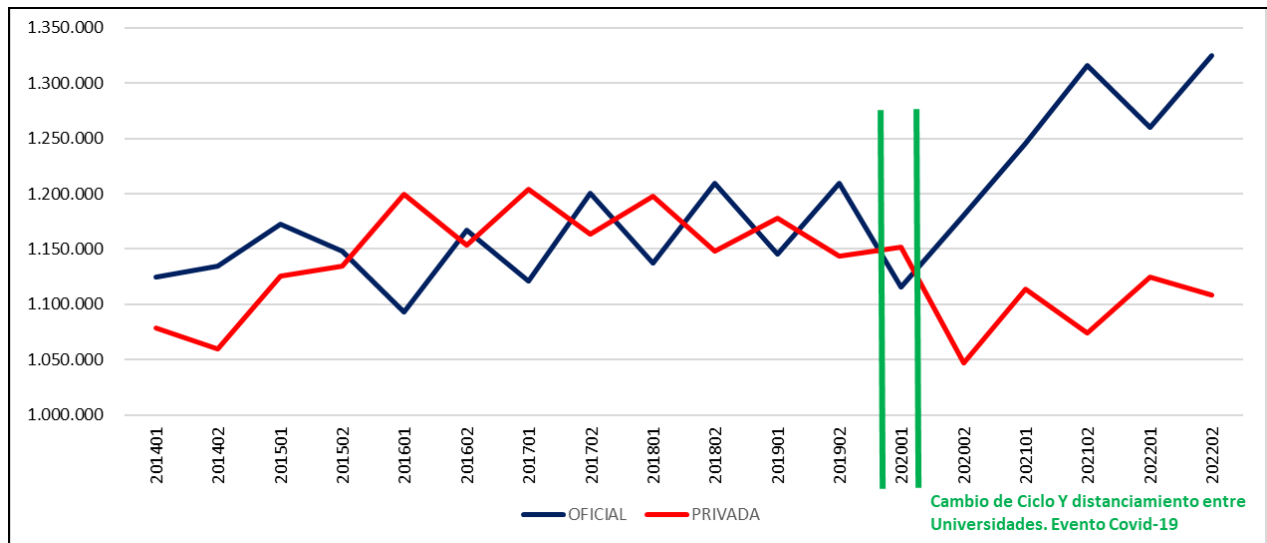


Figure 3. Trend of university enrollment in Colombia between 2014 and 2022 by sector.

Table 2. Pandemic size of enrollment by magnitude and variation from 2019 to 2021.

Period		General Impact		Official Impact		Private Impact	
Initial	Final	Variation	Magnitude	Variation	Magnitude	Variation	Magnitude
201902	202002	-5,4%	- 126.394	-2,4%	- 29.430	-8,5%	- 96.964
202002	202101	6,0%	132.783	5,6%	132.783	6,4%	67.265
202002	202102	7,4%	163.745	11,5%	136.089	2,6%	27.656
201902	202102	1,6%	37.351	8,8%	106.659	-6,1%	- 69.308

Analyzing the variation between one semester and another for each sector, Figure 4 was recreated. In this figure, the official universities show an increase in the variation of enrollment of around 6% and 7% in the second semester between 2016 and 2019 and the falls were increasing, going from around 4% to 5.3% before the pandemic. But with the arrival of the pandemic, after a 7.8% drop in enrollments compared between the second semester of 2019 and the first semester of 2020, enrollments increased consecutively from the second semester of 2020 to the second semester of 2021, representing a break in the cycle of variation of enrollments in official universities. In the first semester of 2022, the official universities returned to their cycle of falls in the first semester and rises in the second semester of enrollment, but the variation of fall was reduced to 4.29%, i.e. the volatility of enrollment between the first and second semesters in public universities decreased. In a counter-cyclical way to the enrollments of the official universities, the private universities increase the variation of enrollments in the first semesters, but before the pandemic they already represented a deceleration in their growth because they were going from growing 6.24% in 2014 to growing 2.65% in the first semester of 2019. That is, before the pandemic, although private sector enrollments were growing, they did so at a slower and slower pace in the booms of their first semesters. But, with the arrival of the pandemic, with the representative drop of more than 8.5% between the second semester of 2020 compared to the second semester of 2019 (see Figure 5 where the inter-annual variation is shown), the fact of the continuous loss of market share of private universities is evidenced. This is also illustrated when despite the increase due to the recovery of economic activity, student enrollments at the end of 2022 do not reach pre-pandemic levels. A tail effect or lag effect of the pandemic can be posited (See Figure 1 and 3).

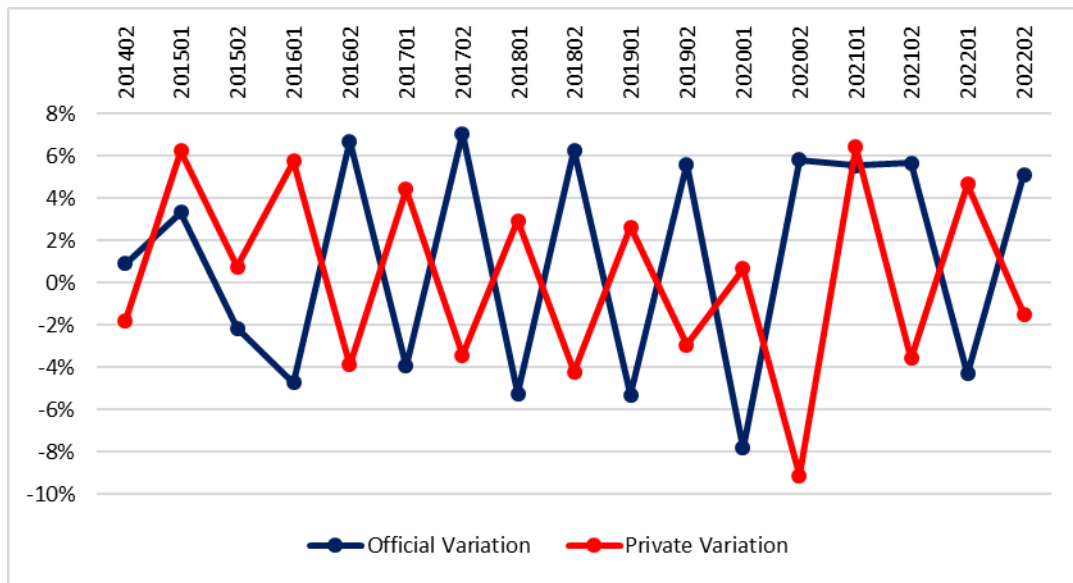


Figure 4. Cycle of Enrollment Variation between 2014 and 2022 by Sector.

Note: Based On Snies Data.

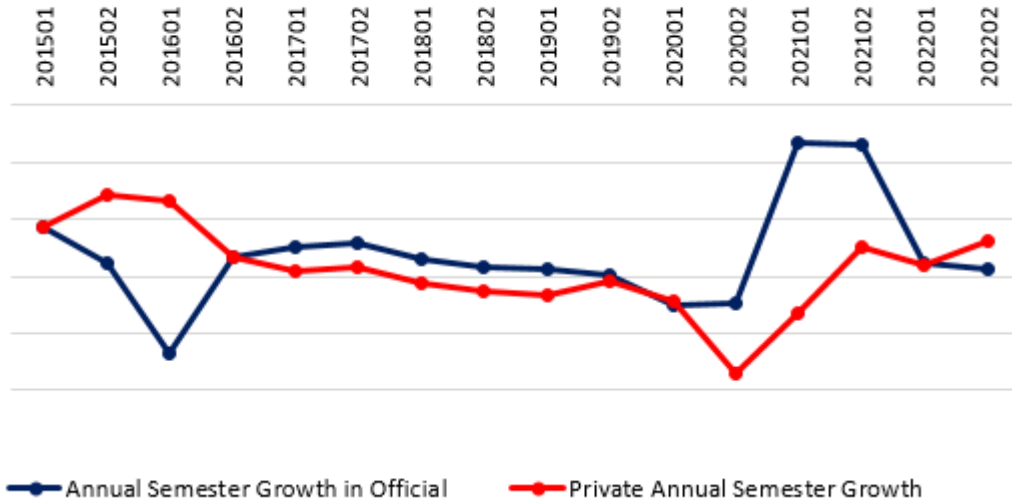


Figure 5. Comparison of Enrollment Between Semesters from 2014 To 2022 By Sector.

Note: Based On Snies Data.

In the analysis of enrollment trends by semester and sector, we incorporated undergraduate and graduate education. Figure 6 shows the results of this analysis. It shows how undergraduate enrollments in the private sector were declining before the arrival of the pandemic. This shows an increase in enrollment in the official sector while private sector enrollment declines to lower levels than in 2014. Even in 2022, the private sector did not reach the 2015 level. While in graduate enrollments, those of the private university grow and those of the official university fall. This may be related to the incentive of zero enrollment by the Colombian state. This incentive favors students of stratum 1, 2 and 3 to access undergraduate degrees.

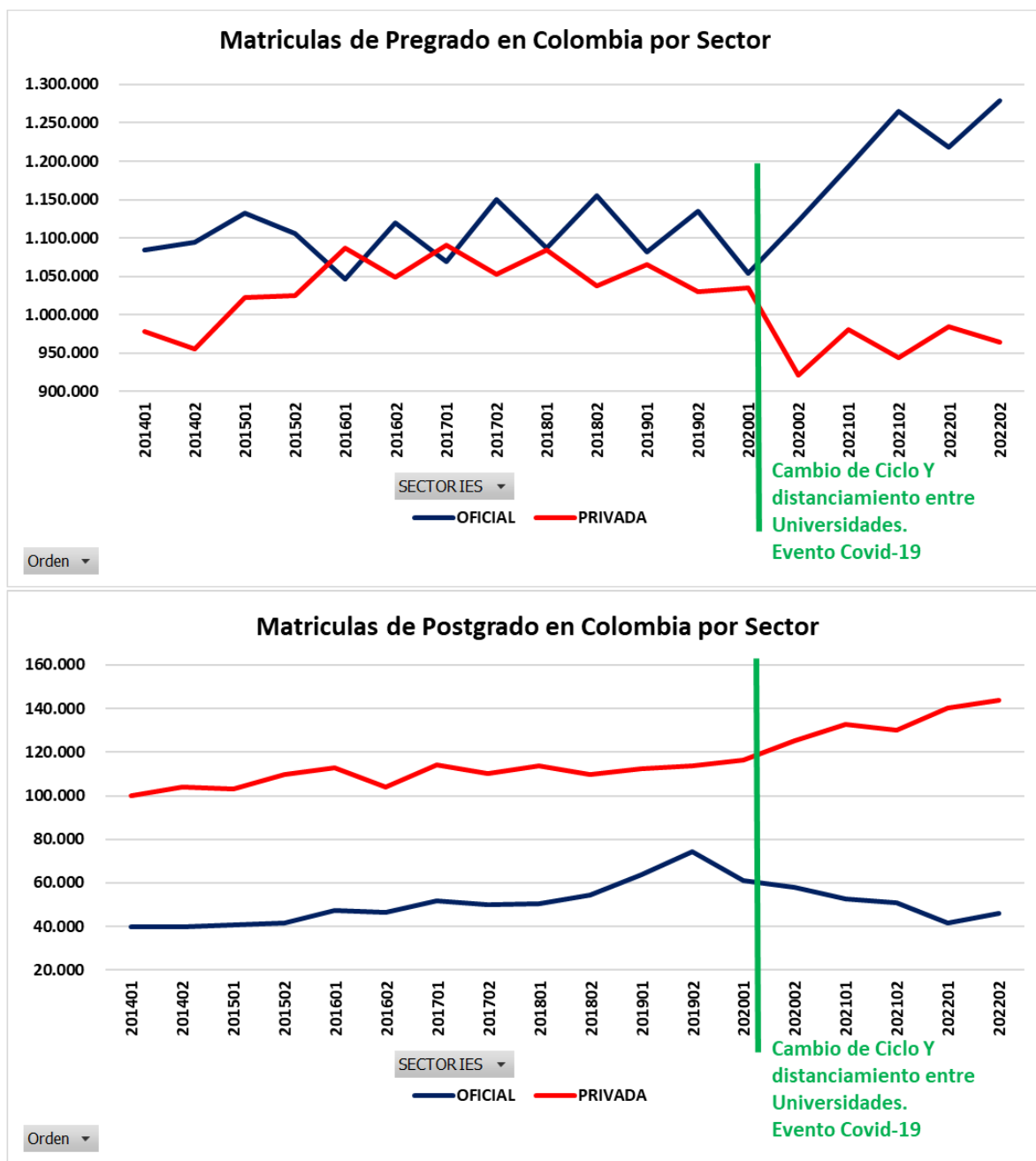


Figure 6. Detail of Enrollment Trends by Undergraduate and Postgraduate Education

Although face-to-face enrollments continue to be the main modality in the national market in each of the modalities and training programs. Analyzing Table 5, it is illustrated how face-to-face enrollments from 2014 to 2022 in the official sector in both undergraduate and graduate have fallen by 4% and 2% respectively, while enrollments in virtual modality in undergraduate and graduate have grown 2791% and 254% respectively. A similar case in the same 8 years, Table 5 shows the private sector with a decrease in undergraduate enrollments in its face-to-face and distance modalities, and graduate enrollments in the distance modality, with drops of 8%, 30%, and 70% respectively. In contrast, in the same sector there were increases in undergraduate and graduate virtual enrollments of 2791% and 254% respectively. This shows a growth and relevance of the virtual modality in the university enrollment market for the official and private sector in the last 8 years. In conjunction with a decline in distance postgraduate programs in the private sector.

On the other hand, the pandemic has increased the opportunity and demand for the virtual modality. Especially in

the private sector postgraduate and official sector undergraduate where enrollments have doubled (101%) and almost tripled (173%) in each respective sector from 2019 to 2022 (see table 3). In addition to mixed modalities in which public universities are also lagging behind the private sector (see Table 5).

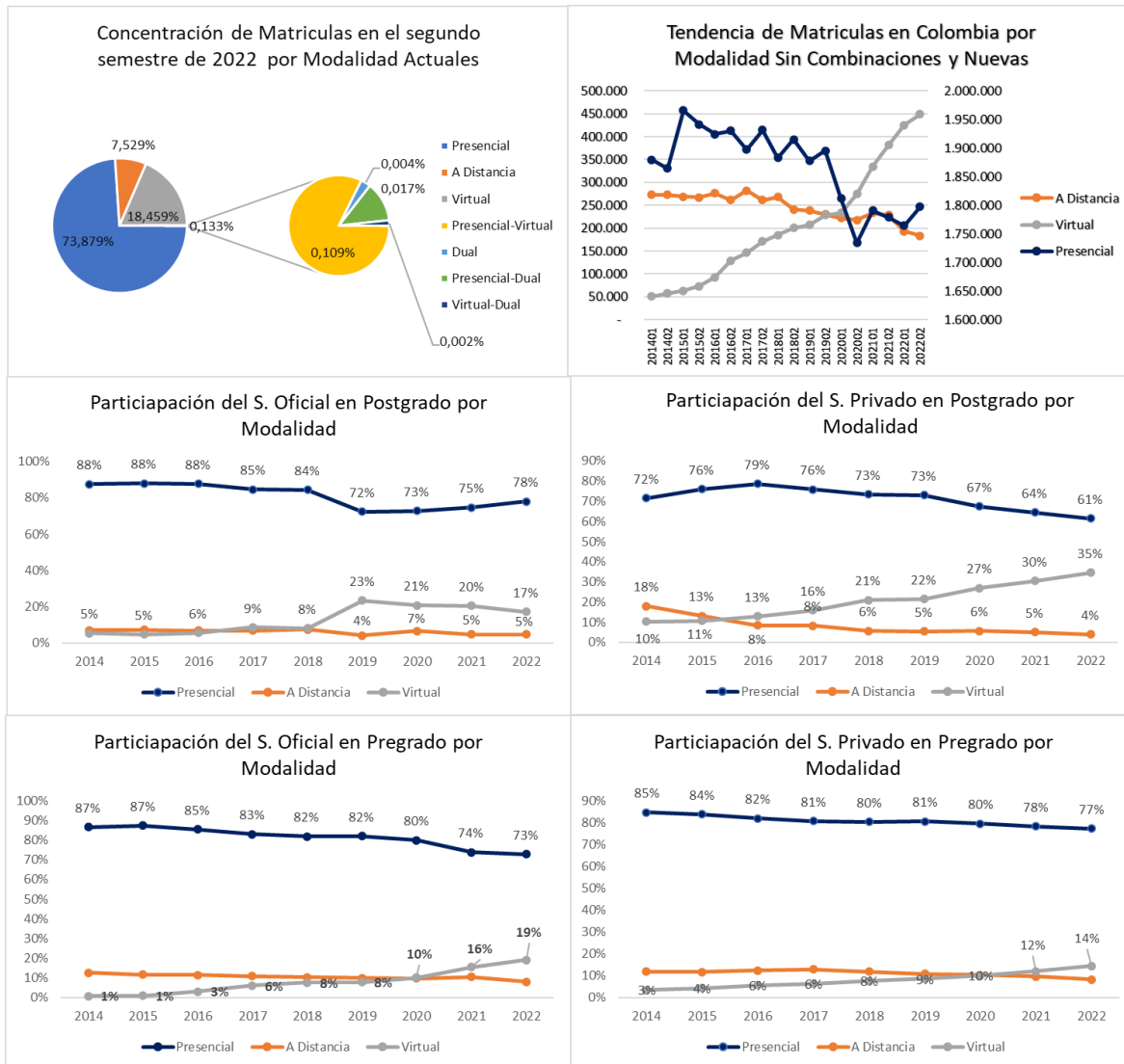


Figure 7. Analysis of Enrollment Concentration by Modalities

Note: Based on SNIES data.

Table 3. Enrollment variation by sector, training and modality

Sector	OFICIAL			PRIVADA		
	Presencial	A Distancia	Virtual	Presencial	A Distancia	Virtual
POSGRADO						
2014-2022	-2%	-27%	254%	19%	-70%	365%
2019-2020	-14%	35%	-24%	-1%	12%	33%
2019-2021	-23%	-15%	-34%	2%	11%	64%
2019-2022	-32%	-30%	-53%	5%	-8%	101%
PREGRADO						
2014-2022	-4%	-27%	2791%	-8%	-30%	324%
2019-2020	-4%	-3%	27%	-8%	-10%	9%
2019-2021	-0,12%	16%	119%	-11%	-19%	29%
2019-2022	-0,04%	-10%	173%	-11%	-29%	56%

Table 4. Annual variation of enrollment between 2019 and 2022 by Sector and Modality

SECTOR IES	MODALIDAD \ AÑO	2015	2016	2017	2018	2019	2020	2021	2022
		OFICIAL							
	Presencial	3,6%	-4,7%	-0,2%	-0,1%	-0,4%	-4,8%	3,7%	-0,4%
	A Distancia	-4,3%	-4,8%	-2,2%	-3,0%	-5,7%	-2,5%	18,4%	-22,9%
	Virtual	14,9%	199,6%	99,0%	25,1%	16,1%	18,9%	63,8%	22,3%
	Presencial-Virtual								Entrando
	Total OFICIAL	2,7%	-2,6%	2,7%	1,1%	0,3%	-2,5%	11,6%	0,9%
PRIVADA									
	Presencial	5,2%	2,3%	-1,1%	-1,5%	-1,0%	-7,2%	-2,6%	0,0%
	A Distancia	1,0%	5,2%	4,1%	-9,4%	-10,0%	-9,3%	-8,6%	-13,2%
	Virtual	29,2%	32,8%	16,2%	19,1%	10,2%	14,3%	19,4%	21,6%
	Presencial-Virtual						Entrando	1007,2%	162,9%
	Dual							Entrando	125,4%
	Presencial-Dual							Entrando	152,4%
	Virtual-Dual							Entrando	-19,6%
	Total PRIVADA	5,7%	4,1%	0,6%	-0,9%	-1,0%	-5,3%	-0,5%	2,0%

Table 5. Market Share of University Enrollment in Colombia by modality and sector

SECTOR IES	MODALIDAD	AÑO								
		2014	2015	2016	2017	2018	2019	2020	2021	2022
OFICIAL	Presencial	44,5%	44,3%	41,9%	41,1%	41,0%	41,0%	40,6%	39,9%	39,2%
	A Distancia	6,4%	5,8%	5,5%	5,3%	5,2%	4,9%	4,9%	5,5%	4,2%
	Virtual	0,5%	0,5%	1,6%	3,0%	3,8%	4,4%	5,5%	8,5%	10,3%
	Presencial-Virtual									
Total OFICIAL		51,4%	50,7%	49,0%	49,5%	50,0%	50,4%	51,1%	53,9%	53,6%
PRIVADA	Presencial	40,6%	41,0%	41,6%	40,5%	39,9%	39,6%	38,3%	35,3%	34,8%
	A Distancia	6,1%	5,9%	6,1%	6,3%	5,7%	5,1%	4,8%	4,2%	3,6%
	Virtual	2,0%	2,5%	3,2%	3,7%	4,4%	4,9%	5,8%	6,6%	7,9%
	Presencial-Virtual						Entrando	0,004%	0,039%	0,100%
	Dual							Entrando	0,001%	0,003%
	Presencial-Dual							Entrando	0,007%	0,018%
	Virtual-Dual							Entrando	0,003%	0,003%
Total PRIVADA		48,6%	49,3%	51,0%	50,5%	50,0%	49,6%	48,9%	46,1%	46,4%

CONCLUSION

The research generated the following 6 conclusions:

Cyclical Enrollment Behavior by Sector: The analysis revealed a notable pattern of cyclical behavior in university enrollments by sector, where official and private universities overlapped in terms of enrollments throughout the study period. This dynamic showed an annual cycle of advantage, with one sector gaining ground in enrollments during one semester and the other sector regaining it in the following semester. However, as time progressed, this cycle became more pronounced, with more dramatic shifts in enrollment shares between sectors. This trend underscores the importance of understanding the competition between the official and private sectors in the Colombian higher education market. As student preferences evolve and adapt, and with the growth of the virtual modality, it is crucial for educational institutions to anticipate these changes and adjust their strategies to remain competitive. Furthermore, this finding highlights the need for constant evaluation of market dynamics and long-term strategic planning by institutions and educational authorities to ensure the sustainability and quality of higher education in the country.

Impact of the Pandemic on University Enrollments: A significant impact of the COVID-19 pandemic was observed on university enrollments in Colombia, with a pronounced decrease in 2020. This drop, marked by the migration of academic activities to the virtual modality and general uncertainty, particularly affected private universities, generating a notable gap between the official and private sectors.

Growth of the Virtual Modality: The virtual modality experienced exponential growth throughout the study period. The increase in student preference for this modality, greatly accelerated by the pandemic, marked a significant change in enrollment dynamics. This growth was particularly notable in the private sector and in graduate programs.

Gap Between Sectors: A growing gap was identified between official and private university enrollments. After the pandemic, official universities surpassed private universities in terms of undergraduate and graduate enrollment, reflecting a change in the dynamics of the educational market.

Changes in the Preference of Study Modalities: A change in the preference of students towards the virtual modality to the detriment of face-to-face and distance modalities was observed. This change indicated greater flexibility in the choice of study programs and greater adoption of online education.

Pandemic Effect on Virtual Modality: The pandemic intensified the opportunity and demand for virtual modality, especially in graduate programs and in the private sector, where virtual enrollments doubled and nearly tripled since 2019.

These conclusions highlight the importance of adapting to changing student preferences and new educational market conditions, as well as the need to rethink strategies and policies in the higher education sector in Colombia.

REFERENCES

- [1]. Álvarez, M. F. S., et al. (2022). Trends in higher education enrollment: Argentina, Brazil, Chile, Colombia, Paraguay and Uruguay: 2000-2018. Villa María: Universidad Nacional Villa María.
- [2]. Bedoya-Dorado, C., Murillo-Vargas, G., & González-Campo, C. H. (2021). University management in times of pandemic by COVID-19: analysis of the higher education sector in Colombia. *Estudios Gerenciales*, 251-264. <https://doi.org/10.18046/j.estger.2021.159.4409>
- [3]. Chaves Campo, C. F., Muñoz Bonilla, H. A., & González Guacaneme, G. (2021). University academic desertion and mandatory preventive isolation in Colombia: Study "CHEMA - COVID-19." *Lumen Gentium Journal*, 5(1), 99-113. <https://doi.org/10.52525/lq.v5n1a7>
- [4]. Espinal, D., Scarpetta, G. and Cruz, N. (2020). Strategic prospective analysis of higher education in Colombia. *Culture, Education and Society*, 11(1). 177-196. DOI: <http://dx.doi.org/10.17981/cultedusoc.11.1.2020.13>
- [5]. García, G. (2019). Impacts and contradictions of the implementation of the "Ser Pilo Paga" public policy 4 GISSEL GARCÍA GARCÍA *. *Revistas de La Pontificia Universidad Javeriana*, 12, 41-62. Retrieved from <https://revistas.javerianacali.edu.co/>
- [6]. González, J. J., TAFUR OSORIO, M. V., Martínez Leal, D. A., López-Garay, H., & Lopera, D. (2021). The challenges of university planning in the context of the crisis of the present: an alternative review. *International Journal of Systems*, 24(1). <https://doi.org/10.7203/ris.24.1.20340>.
- [7]. Quintero Leguizamon, J. F. (2020). Public higher education in Colombia in the face of Covid-19. *CAMINHOS DA EDUCAÇÃO diálogos Culturas E Diversidades*, 2(2), 85-102. <https://doi.org/10.26694/caedu.v2i2.11239>
- [8]. Laboratory of Economics of Education (LEE) of the Pontificia Universidad Javeriana (2022). Report 58. Evolution of Higher Education Enrollment in Colombia. Available at <https://economiadelaeducacion.org/>
- [9]. Ministry of National Education of Colombia (2023). Higher Education in Figures. Edition No. 1 - I Semester of 2023. Higher education enrollment: analysis and forecast 2022-2023. Available at: https://snies.mineducacion.gov.co/1778/articles-416752_boletin_jun_2023.pdf
- [10]. Pirela-Espina, W. A. (2022). Digital divide and quality of university education Latin America during Covid-19. *Revista Electrónica En Educación y Pedagogía*, 6(11), 43-57. <https://doi.org/10.15658/rev.electron.educ.pedagog22.11061104>
- [11]. Colombian Graduate Network (2023). Colombian graduate programs: in figures. Available at: https://repositoriocdim.esap.edu.co/bitstream/handle/123456789/26443/Posgrados-Colombianos_VDigital-ASCUN.pdf?sequence=1&isAllowed=y
- [12]. Rincón Quiñones, C., & Espitia Suárez, A. (2021). Colombia's higher education at risk: where are the students? *Ecós de Economía*, 24(51). <https://doi.org/10.17230/ecos.2020.51.1>
- [13]. Roca, A. M., & Granger, A. (2021). Demographic transition and its consequences on university enrollment in Colombia. *Economía & Región*, 14(1). <https://doi.org/10.32397/er.vol14.n1.1>
- [14]. Verdú, C. A., Espitia, C. G. G., & Mora Rodríguez, J. J. (2013). Determinants of the demand for university education in Colombia, 1980-2010. *Revista de Economía Institucional*, 15(29).
- [15]. Velandia Sedano, M. P. (2021). Encierro del/la estudiante. *Revista Argentina de Estudios de Juventud*, 15, e058. <https://doi.org/10.24215/18524907e058>

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