Market Resilience in Crisis: Post-Pandemic Enrollment Shifts and Sector-Based Performance in U.S. Higher Education, 2019–2024

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Abstract

The COVID-19 pandemic disrupted the traditional stability of the U.S. higher education market, exposing distinct vulnerabilities across different institutional types. Rather than a uniform decline, enrollment data from 2019–2024 reveal a fragmented landscape where student choice shifted significantly based on sector responsiveness. Using national enrollment percentage-change data drawn from the Integrated Postsecondary Education Data System (IPEDS), the analysis evaluates sector-specific differences and assesses whether institutional sector is significantly associated with changes in enrollment. Statistical methods, including ANOVA and non-parametric alternatives, are used to test the significance of observed differences. Both the categorical analysis (Chi-Square) and the continuous analysis (ANOVA) converge on the same finding: Institution Sector is a critical determinant of enrollment trends. The Chi-Square test reveals a strong dependency where PAB and Public 2-year sectors are disproportionately represented in the "Extreme Decrease" category, while private sectors dominate the "High Increase" category. Results indicate substantial variation across sectors, with for-profit institutions showing growth while public two-year and Public Associate-Dominant (PAB) institutions experienced the steepest declines. The study argues that for public institutions to recover, they must move beyond traditional enrollment management and integrate the more aggressive, consumer-oriented recruitment tactics utilized by their private competitors.

Keywords: *Post-Pandemic Enrollment Trends, Enrollment Strategy, Market Segmentation and Sectoral Inequality, Student Recruitment, Higher Education Marketing, Regional Divergence, Private Institutions, Public Institutions, Public Two-year Colleges.*

Introduction

The COVID-19 pandemic disrupted higher education globally, leading to shifts in student behavior, institutional operations, student recruitment and enrollment patterns. In the United States, early pandemic years saw widespread declines in undergraduate enrollment, particularly within community colleges and public institutions. As pandemic effects receded, questions emerged about long-term structural changes in enrollment by institutional sector.

This paper examines the post-pandemic effect of COVID-19 on U.S. student enrollment by institutional sector from 2019–2024. The goal is twofold: (1) to document sector-specific enrollment changes using descriptive analysis, and (2) to evaluate whether institutional sector is statistically associated with enrollment change.

Review of Literature

The COVID-19 pandemic caused unprecedented disruption in U.S. higher education, producing sharp enrollment declines across sectors from 2020–2022, followed by uneven regaining patterns since 2023. Research clearly shows sectoral disparities, leadership and policy challenges, and changing student preferences regarding flexible and career-oriented education. Several studies show that U.S. higher education enrollment dropped significantly during the pandemic. However, in fall 2024, undergraduate enrollment rates increased for the first time since before the pandemic. According to the National Student Clearinghouse Research Center (NSCRC), "Undergraduate enrollment increased across major institutional sectors, with community colleges (Public two-year and Public PABs) seeing the largest growth (+5.4%, +288,000)".

Enrollment Fluctuations and Recovery Dynamics

While the *Current Term Enrollment Estimates* (CTEE) show a macro-level "rebound" in total undergraduate enrollment for 2024, micro-level findings suggest that this recovery is fragile. Vaterlaus et al. (2024) indicated that “based on college student responses, pandemic recovery was a multidimensional process” and suggested that “future studies should also monitor how college student pandemic recovery changes over time”.
Earlier analysis by Carmean, Kil, and Baer (2021), utilizing data from 12.6 million students, confirmed that enrollment loss was concentrated in community colleges and regional public institutions. This was further supported by the NSCRC (2021), which provided regular updates on the widening gap in student success during the pandemic onset.

Sectoral Shifts and Long-Term Trends

Francis and Goodman (2025) utilized longitudinal data from Massachusetts—mirroring broader national trends—to examine enrollment patterns five years after the initial pandemic disruption. Their research challenges the assumption of a universal "return to normal," instead identifying "sustained effects" on both the size and demographic composition of the student body. They demonstrate a sustained sectoral shift; as of Fall 2024, they show that “relative to pre-pandemic trends, fall 2024 enrollment is down 2% in local public schools, up 16% in private schools, and up 50% in home schools”.
In California, Fairlie and Bulman (2022) explored how the pandemic impacted enrollment patterns and academic outcomes within the community college system, concluding that “enrollment changes were substantial across a wide range of fields and were large for both vocational courses and academic courses that can be transferred to four-year institutions”. Cummins (2025) later used system mapping in California to visualize these long-term educational pipeline effects, identifying a structural "post-pandemic onset" enrollment contraction driven by a confluence of demographic shifts and "pandemic-induced mobility" that has not reversed.

Structural Changes and the "Next Normal"

The post-pandemic classroom has also exposed deep inequities in access, digital readiness, and persistence, which Whitson and Brazeal (2022) argue have reshaped enrollment behaviors and expectations. As a result, scholars like Glantz et al. (2021) propose that the use of new practices and tools should take hold as changes to institutional procedures are incorporated into the "next normal".
Although final data on student enrollment for 2025 had not been published at the time of this research, initial estimates from the CTEE (2025) indicate that total postsecondary enrollment is up 3.2% in 2025 compared to 2024. While undergraduate enrollment grew to 15.3 million, it remains 2.4% below pre-pandemic levels. Conversely, graduate enrollment is now 7.2% higher than in 2020. Despite these gains, Schueler and Miller (2024) found substantial variation in public school and college enrollment in Virginia, suggesting that mobility patterns continue to affect higher education pipelines.

Method

Data Source

The Integrated Postsecondary Education Data System (IPEDS) is a system of 12 interrelated survey components conducted annually. It covers approximately 5,819 U.S. postsecondary institutions eligible for Title IV federal student aid and gathers data from every college, university, and technical and vocational institution that participates in federal student financial aid programs.

Variables

- **Dependent Variable:** Percentage change in student enrollment from 2019 to 2024.
- **Independent Variable:** Institutional sector, categorized as:

- All Private, For-Profit Institutions
- Private, Not-for-Profit, 4-year
- All 4-year Institutions
- All Private, Not-for-Profit Institutions
- Public, 4-year
- Overall
- All Public Institutions
- Public PAB (primarily associate degree-granting baccalaureate institutions)
- All 2-year Institutions
- Public, 2-year
- All PAB Institutions

Statistical Approach

Descriptive Statistics - Enrollment data were derived from IPEDS, representing national enrollment counts by institutional sector for the years 2019 and 2024. The percentage changes in student enrollment for major institutional categories were calculated for each region. For each region, as well as at the national level, changes in student enrollment were analyzed by institutional sector to identify which sectors were most and least affected by the COVID-19 pandemic
Test of Significance - Because the dependent variable is continuous (percentage change) and the independent variable is categorical (institutional sector), an Analysis of Variance (ANOVA) was selected as the standard method for evaluating differences across multiple groups.
Two complementary statistical approaches were employed:

1. **Chi-Square Test of Independence:** To analyze the association between sector and categorical enrollment impact.
2. **Analysis of Variance (ANOVA):** To test for significant differences in mean percentage enrollment change.

Results

Analysis of Change in Student Enrollment by Institution Sector and Region

National Overview (United States, 2019–2024)

Nationally, student enrollment in higher education declined by an overall 3.16% between 2019 and 2024. The disaggregated data reveal that public institutions experienced the sharpest declines (–4.71%), particularly within two-year colleges (–9.69%) and public programs of primarily associate degree-granting baccalaureate institutions (PABs) by –7.99%. By contrast, private for-profit institutions exhibited modest growth (+5.12%), suggesting that their flexible, online-oriented models may have absorbed some displaced students.
Across the four-year sector, enrollment remained relatively stable (+0.27% overall), masking divergent patterns between private not-for-profit four-year colleges (+0.36%) and public four-year universities (–0.72%). These figures indicate that while the U.S. higher education system is rebounding unevenly, institutional type remains a critical determinant of post-pandemic recovery, with for-profit providers emerging as net beneficiaries of shifting student preferences toward career-aligned and accessible learning pathways.

Table 1. Percentage Change in Student Enrollment — United States, 2019–2024

Institution Sector	**% Change (2019–2024)**
Overall	-3.16%
All 4-year Institutions	0.27%
All PAB Institutions	-10.61%

Institution Sector	% Change (2019–2024)
All 2-year Institutions	-9.18%
All Public Institutions	-4.71%
All Private, not-for-profit Institutions	0.17%
All Private, for-profit Institutions	5.12%
Public, 4-year	-0.72%
Private, not-for-profit, 4-year	0.36%
Public, PAB	-7.99%
Public, 2-year	-9.69%

Midwest Region

In the Midwest, enrollment declined more sharply than the national average, with an overall decrease of 4.46%. Public institutions experienced notable contractions (–4.69%), driven primarily by declines at two-year colleges (–4.94%) and public PAB institutions (–22.55%). Private institutions did not offset these losses, as both private not-for-profit (–5.10%) and for-profit (+1.54%) sectors posted weak or marginal growth.
The broad-based downturn in both public and private four-year institutions (–3.43%) may suggest that demographic stagnation and limited population growth in the Midwest have compounded the pandemic's impact. The Midwest thus reflects a pattern of institutional retrenchment and limited diversification, with community and applied institutions being particularly vulnerable.

Table 2. Percentage Change in Student Enrollment — Midwest Region, 2019–2024

Institution Sector	% Change (2019–2024)
Overall	-4.46%
All 4-year Institutions	-3.43%
All PAB Institutions	-26.04%
All 2-year Institutions	-4.97%
All Public Institutions	-4.69%
All Private, not-for-profit Institutions	-5.10%
All Private, for-profit Institutions	1.54%
Public, 4-year	-3.83%
Private, not-for-profit, 4-year	-4.12%
Public, PAB	-22.55%
Public, 2-year	-4.94%

Northeast Region

The Northeast shows the most severe enrollment contraction across all U.S. regions, with an overall decline of 4.46% but disproportionately large losses among public and two-year institutions. Specifically, public institutions fell by 10.83%, two-year colleges by 15.20%, and public PAB programs by an extraordinary 68.19%. In contrast, private not-for-profit institutions registered modest growth (+3.78% overall; +3.06% among four-year colleges), reflecting the region's strong concentration of elite and well-endowed universities capable of weathering enrollment volatility.

This sharp dichotomy underscores a deepening structural inequality between selective private universities and underfunded public systems in the Northeast, where demographic decline and rising tuition costs may further constrain access to public higher education.

Table 3. Percentage Change in Student Enrollment — Northeast Region, 2019–2024

Institution Sector	% Change (2019–2024)
Overall	-4.46%
All 4-year Institutions	-0.24%
All PAB Institutions	-45.99%
All 2-year Institutions	-15.20%
All Public Institutions	-10.83%
All Private, not-for-profit Institutions	3.78%
All Private, for-profit Institutions	-6.60%
Public, 4-year	-5.38%
Private, not-for-profit, 4-year	3.06%
Public, PAB	-68.19%
Public, 2-year	-15.54%

South Region

In the South region, enrollment trends are comparatively more stable, with only a 2.04% overall decrease—a smaller decline than in other regions. The four-year sector shows resilience, with both public and private not-for-profit universities posting modest gains (+1.72% and +3.05%, respectively). However, the two-year sector remains weak, showing a 10.44% overall decline, suggesting that the community-college pipeline remains fragile despite the region's strong population base. Public PAB institutions (–1.43%) and for-profit providers (–2.41%) also declined, albeit mildly.
The South's relative stability indicates regional resilience, likely supported by higher in-migration, population growth, and the strong presence of large state university systems that retained enrollment through hybrid and online options.

Table 4. Percentage Change in Student Enrollment — South Region, 2019–2024

Institution Sector	% Change (2019–2024)
Overall	-2.04%
All 4-year Institutions	2.36%
All PAB Institutions	-5.87%
All 2-year Institutions	-10.44%
All Public Institutions	-2.77%
All Private, not-for-profit Institutions	1.72%
All Private, for-profit Institutions	-2.41%
Public, 4-year	1.72%
Private, not-for-profit, 4-year	3.05%
Public, PAB	-1.43%
Public, 2-year	-10.31%

West Region

The Western region presents a mixed recovery, with an overall enrollment decline of 2.34%, but substantial growth in private for-profit institutions (+11.15%). This surge suggests that market-driven, online-oriented education providers capitalized on post-pandemic demand for flexible learning. Traditional institutions exhibited mild improvement, with public four-year universities (+1.62%) and private not-for-profit institutions (+1.24%) recovering slightly. Nonetheless, two-year institutions (–7.88%) and public PAB programs (–7.66%) experienced ongoing declines, reinforcing the nationwide trend of weakening enrollment in short-cycle education.
Overall, the West exemplifies a dual recovery trajectory—a modest rebound in four-year enrollment coupled with continued attrition in public and sub-baccalaureate programs.

Table 5. Percentage Change in Student Enrollment — West Region, 2019–2024

Institution Sector	% Change (2019–2024)
Overall	-2.34%
All 4-year Institutions	2.17%
All PAB Institutions	-8.19%
All 2-year Institutions	-7.88%
All Public Institutions	-4.32%
All Private, not-for-profit Institutions	1.24%
All Private, for-profit Institutions	11.15%
Public, 4-year	1.62%
Private, not-for-profit, 4-year	0.61%
Public, PAB	-7.66%
Public, 2-year	-9.64%

Comparative Regional Analysis

The regional breakdown confirms that the post-pandemic enrollment recovery in U.S. higher education has been geographically uneven. For-profit institutions recovered more strongly than any other sector, particularly in the West. Private not-for-profit universities displayed relative resilience in the Northeast and South. Conversely, public two-year institutions remain the most vulnerable nationwide, reflecting their dependence on in-person enrollment, local economies, and state funding structures. Primarily associate degree granting baccalaureate (PAB's) programs experienced sharp declines across all regions, indicating a contraction in career-technical education pathways
These findings point to a reconfiguration of the higher-education landscape, where private and market-oriented institutions are expanding their relative share of enrollment, while public two-year and PAB programs continue to bear the brunt of post-pandemic disruptions. The new landscape recognizes a new pattern of market segmentation and a clear need for innovative enrollment strategy by higher education institutions in the US.

Table 6. Comparative Regional Analysis of Enrollment Change

Region	Overall Enrollment Change	Strongest Sector	Weakest Sector
United States	–3.16%	Private, for-profit (+5.12%)	Public 2-year (–9.69%)
Midwest	–4.46%	Private, for-profit (+1.54%)	Public PAB (–26.04%)
Northeast	–6.60%	Private not-for-profit (+3.78%)	Public PAB (–68.19%)

Region	Overall Enrollment Change	Strongest Sector	Weakest Sector
South	–2.04%	Private, not-for-profit 4-year (+3.05%)	Public PAB (–10.44%)
West	–2.34%	Private, for-profit (+11.15%)	Public 2-year (–8.19%)

Testing the Relationship Between Sectoral Inequality and Regional Divergence

To investigate whether institutional sector is significantly associated with percentage change in enrollment, appropriate statistical tests must be selected based on data characteristics.

Association Between Sector and Enrollment Impact Categories

To examine the relationship between institution sector and student enrollment changes, data were analyzed across 11 distinct sectors and four U.S. regions. Two complementary statistical approaches were employed: a non-parametric analysis of enrollment impact categories and a parametric comparison of mean percentage changes.

Chi-Square Test of Independence

First, percentage changes in enrollment were recoded into a five-level ordinal measure of enrollment impact: *High Increase* (> +2%), *Mild Increase* (0% to +2%), *Mild Decrease* (0% to −5%), *Substantial Decrease* (−5% to −15%), and *Extreme Decrease* (< −15%).
A Chi-square test of independence was conducted to determine if the distribution of these impact categories differed by institution sector. The relation between these variables was significant, $\chi^2(40, N = 44) = 72.33$, $p = .001$. To assess the strength of this association, Cramer's V was calculated. The result indicated a very strong association ($V = .64$), suggesting that institution sector is a robust predictor of the severity of enrollment changes. Specifically, Public Bachelor's (PAB) and Public 2-year institutions were disproportionately represented in the "Extreme Decrease" category, while Private For-Profit institutions appeared most frequently in the "High Increase" category.
This confirms that knowing the institution sector provides substantial predictive power regarding the severity of enrollment changes. Specifically, Public Bachelor's (PAB) and Public 2-year institutions were disproportionately represented in the "Extreme Decrease" category.

Analysis of Mean Enrollment Change (ANOVA)

A one-way analysis of variance (ANOVA) was conducted to test whether the mean percentage change in enrollment differed significantly by sector. Preliminary assumption testing revealed a violation of the normality assumption (Shapiro-Wilk, $W = .86$, $p < .001$), though homogeneity of variance was technically preserved (Levene's test $p = .052$).
Given the violation of normality, both Welch's ANOVA (robust to unequal variances) and the Kruskal-Wallis H test (non-parametric) were conducted alongside the standard ANOVA to ensure the validity of the results. All three tests confirmed a statistically significant difference in enrollment changes between sectors:

- **Standard ANOVA:** $F(10, 33) = 3.73$, $p = .002$
- **Welch's ANOVA:** $F(10, 10.9) = 3.05$, $p = .031$
- **Kruskal-Wallis:** $H(10) = 33.84$, $p < .001$

Post hoc comparisons using Tukey's HSD test indicated that the **All PAB Institutions** sector experienced significantly steeper declines (M = -28.6%) compared to **All Private, For-Profit Institutions** ($p = .003$) and **Private, Not-for-Profit, 4-Year Institutions** ($p = .011$). These findings confirm that while private sectors generally maintained stability or slight growth, public 2-year and public bachelor's institutions faced severe enrollment contractions across all regions.

Both the categorical analysis (Chi-Square) and the continuous analysis (ANOVA) converge on the same finding: **Institution Sector is a critical determinant of enrollment trends.** The **Chi-Square test** reveals a strong dependency where PAB and Public 2-year sectors are disproportionately represented in the "Extreme Decrease" category, while private sectors dominate the "High Increase" category. The **ANOVA** confirms that these differences in mean enrollment change are statistically significant, driven primarily by the severe declines in Public Bachelor's and Public 2-year institutions.

Discussion and Conclusion

The post-pandemic enrollment landscape reveals a clear market segmentation across sectors. For-profit institutions recovered more strongly than any other sector, while public institutions—especially two-year and PAB institutions—suffered significant losses. The regional breakdown confirms that the post-pandemic enrollment recovery in U.S. higher education has been geographically uneven.
These findings underline a reconfiguration of the higher education landscape, where private and market-oriented institutions are expanding their relative share of enrollment, while public two-year and applied programs continue to bear the brunt of post-pandemic disruptions. Such pattern clearly requires reassessment of old enrollment strategy by higher education institutions in the US.

Conclusion

This study documents substantial sector-level variation in post-pandemic enrollment changes between 2019 and 2024. Two-year and PAB institutions absorbed the largest enrollment declines, reflecting their higher concentration of low-income, first-generation, and adult learners. In contrast, for-profit institutions may have leveraged flexible online offerings to attract displaced students.
These findings highlight a clear market segmentation and the deepening stratification of postsecondary opportunity in the post-pandemic era and underscore the need for differentiated enrollment strategy responses to support the sectors most adversely affected.
At the time of this writing (December 2025), the final enrollment figures for spring and fall 2025 had not been published by IPEDS. These figures are expected to be released in early 2026, which will require further analysis to confirm the findings of this study. Such analysis will strengthen the empirical foundation for sector-specific policy interventions aimed at enrollment recovery.

REFERENCES

[1] BestColleges. (2025). *U.S. college enrollment decline: Facts and figures*. https://www.bestcolleges.com/research/college-enrollment-decline/
[2] Carmean, G., Kil, D., & Baer, L. (2021). *Why data matters for student success in a post-pandemic world*.
[3] Cummins, M. (2025). *System mapping in California and pipeline effects*.
[4] Fairlie, R. W., & Bulman, G. (2022). *The impact of COVID-19 on community college enrollment and student success: Evidence from California administrative data* (EdWorkingPaper No. 22-602). Annenberg Institute at Brown University.
[5] Francis, A., & Goodman, J. (2025). School enrollment shifts five years after the pandemic. *Economics of Education Review, 109*. https://doi.org/10.1016/j.econedurev.2025.102734
[6] Glantz, E. J., Gamrat, C., Lenze, L., & Bardzell, J. (2021, March 16). Improved student engagement in higher education's next normal. *EDUCAUSE Review*.
[7] National Student Clearinghouse Research Center. (2021, April 29). *COVID-19: Stay informed with the latest enrollment information*.
[8] National Student Clearinghouse Research Center. (2025a, January). *Current term enrollment estimates expanded edition: Fall 2024*.
[9] National Student Clearinghouse Research Center. (2025b, May 22). *Current term enrollment estimates (CTEE)*. https://nscresearchcenter.org/current-term-enrollment-estimates/
[10] Schueler, E., & Miller, A. (2024). Post-pandemic onset public school enrollment and mobility: Evidence from Virginia. *Educational Evaluation and Policy Analysis, 46*(4), 788–794.
[11] Vaterlaus, J. M., et al. (2024). *Pandemic recovery as a multidimensional process*.

[12] Whitson, K., & Brazeal, L. (2022). *Inequities and enrollment behaviors*. EBSCOhost.