

A Mathematical Analysis of the Present Status and Challenges of Higher Education in Nepal

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Abstract

Rapid expansion of higher education in Nepal has been accompanied by uneven institutional development and persistent structural weaknesses. This study examined the sector's scale, distribution, and growth trajectory to identify key challenges and inform policy priorities. The analysis drew on enrolment records from the University Grants Commission and the Ministry of Education, Science and Technology, supplemented by case studies of Tribhuvan University, Kathmandu University, and Pokhara University. Methods included descriptive statistics, ratio analysis, compound annual growth rate estimation, log-linear regression modelling, and market-concentration measures. National enrolment increased from approximately 407,000 students across 12 universities and academies in 2015/16 to 749,392 students across 30 universities and academies operating 1,608 campuses in 2025/26. Conditional on the continuation of observed trends, the regression model projected enrolment of approximately 983,000 students by 2030. Institutional concentration remained pronounced: Tribhuvan University accounted for approximately 61% of national enrolment, whereas Kathmandu University and Pokhara University together accounted for less than 8%, despite having substantially lower student-to-staff ratios. No-Objection Certificate issuance, used as a proxy for outward student mobility, indicated that more than 100,000 Nepali students sought overseas study in a recent fiscal year. Five interlinked challenges emerged: institutional concentration and limited diversification, funding that lagged behind enrolment growth, increasing outward student mobility, fragmented and inconsistently implemented quality assurance, and geographic and gender disparities. These

findings indicate that sectoral expansion has coexisted with substantial structural imbalances. The study provides a quantitative basis for policy responses to these challenges while emphasizing that inconsistencies across official and secondary data sources constrain interpretation and evidence-based planning.

Keywords: Higher Education; Enrolment Trends; Institutional Concentration; Student Mobility; Nepal

INTRODUCTION

Higher education is widely regarded as the principal engine of human-capital formation, economic productivity, and social mobility in developing economies. In Nepal, tertiary education began formally in 1918 with the establishment of Tri-Chandra College, then affiliated with Patna University in India, and matured into an autonomous national system with the founding of Tribhuvan University (TU) in 1959. Since the government's adoption of a multi-university policy in the early 1980s, the sector has expanded from a single national university to, as of 2025/26, 30 universities and academies operating through 1,608 constituent and affiliated campuses nationwide.

This numerical expansion, however, has not been matched by a proportionate improvement in institutional quality, equitable geographic distribution, or financing capacity. Nepal's higher-education system remains characterised by an extreme concentration of enrolment in a single institution (Tribhuvan University), heavy dependence on affiliated colleges rather than fully resourced constituent campuses, chronic underfunding relative to student numbers, and an accelerating outflow of high-achieving students to universities abroad. These conditions make Nepal a useful case for a quantitatively grounded assessment of how a rapidly growing but structurally fragile higher-education system behaves under sustained demand pressure.

This report undertakes such an assessment. Rather than describing the sector in purely narrative terms, it applies standard mathematical and statistical tools — growth-rate computation, ratio analysis, regression modelling, and concentration indices — to publicly available enrolment, budget, and staffing data, and it grounds these indicators in three case-study universities selected to represent the range of institutional types found in Nepal: a very large, historic public university (Tribhuvan University), a mid-sized autonomous public university with a technical orientation (Kathmandu University), and a mid-sized multi-campus regional public university (Pokhara University).

Policy discussion of Nepali higher education has historically relied on descriptive statements — that the sector is 'expanding,' that quality is 'a concern,' that brain drain is 'increasing' — without a corresponding quantitative anchor that would allow the magnitude, rate, and trajectory of these phenomena to be compared over time or across institutions. Without such quantification, it is difficult to determine, for example, whether enrolment growth is accelerating or decelerating, whether the outflow of students abroad is growing faster or slower than domestic enrolment, or how resource intensity differs meaningfully between institutions of different sizes. This report addresses that gap by translating available administrative data into a small set of interpretable mathematical indicators.

Objectives of the Study

- To quantify the growth trajectory of higher-education enrolment in Nepal between 2015/16 and 2025/26 using compound annual growth rate and regression analysis.
- To measure the degree of institutional concentration in Nepal's university system using market-share and concentration indicators, with particular reference to Tribhuvan, Kathmandu, and Pokhara Universities.
- To compare resource-intensity indicators — budget per student and student-to-staff ratio — across the three case-study universities.
- To quantify the scale and trend of outward student mobility (brain drain) using No-Objection Certificate (NOC) issuance data.
- To project enrolment to the year 2030 under a continuation of current growth trends, and to discuss the capacity and financing implications of that projection.
- To derive policy-relevant recommendations from the quantitative findings.

Significance of the Study

The findings are intended to be of use to three audiences. For policymakers at the Ministry of Education, Science and Technology and the University Grants Commission, the quantitative projections provide a numerical basis for medium-term capacity and budget planning. For university administrators, the comparative ratio analysis offers a benchmark against which resource allocation decisions can be evaluated. For researchers and students of educational planning, the report demonstrates, on a concrete national case, how standard growth-accounting and regression tools can be applied to sparse but real administrative data without requiring access to proprietary datasets.

Scope and Limitations

The analysis is confined to formal tertiary education (Bachelor's, Postgraduate Diploma, Master's, M.Phil., and Ph.D. programmes) regulated under the University Grants Commission Act, and it does not extend to technical and vocational education and training (TVET) administered outside the university system. The case studies are limited to three universities selected for data availability and their contrasting institutional profiles; a full census of all 30 universities and academies was outside the feasible scope of this report. A material limitation, discussed further in Section 8, is that enrolment and budget figures reported by different official and secondary sources for the same institution and year are not always mutually consistent; where such discrepancies were found, the report states the figures used and their source rather than silently reconciling them.

Literature Review

Historical Development of Higher Education in Nepal

Nepal's modern higher-education system traces its origin to Tri-Chandra College (1918), affiliated with Patna University. Tribhuvan University, established in 1959, became the country's first indigenous university and remained the sole university for over two decades. The government's adoption of a multi-university concept in the early 1980s led to the sequential establishment of Mahendra Sanskrit University (1986), Kathmandu University (1991), Purbanchal University (1993) and Pokhara University (1997), followed in the 2000s and 2010s by Lumbini Buddhist University, Agriculture and Forestry University, Mid-Western University, Far-Western University, and several other provincial and specialised universities, bringing the total to 30 universities and academies by 2025/26.

Enrolment Studies

Existing enrolment studies consistently document TU's structural dominance of the sector. Nepal's own EMIS (Education Management Information System) reporting, published annually by the UGC, has recorded TU's share of national tertiary enrolment at figures ranging from roughly 79 percent (2015/16) to above 87 percent in some UGC institutional summaries, though more recent multi-university expansion has gradually reduced this share. A 2023 study published in the CDC Journal examining enrolment trends in tertiary education noted that TU's enrolment has historically represented around 80

percent of tertiary institutions in a given year, and that year-on-year enrolment change has been volatile, including a documented 11.2 percent decline in one academic year followed by a 40.7 percent increase and a further 17.0 percent increase in subsequent years — a volatility pattern this report revisits quantitatively in Section 4.

Quality Assurance and Accreditation Literature

A growing body of Nepal-focused literature examines the Quality Assurance and Accreditation (QAA) system introduced by the UGC in 2007 under the World-Bank-supported Second Higher Education Project. Reviews of QAA implementation report that participation remains low relative to the number of eligible campuses — one study found only a small fraction of TU-affiliated institutions had completed accreditation despite decades of programme availability — and attribute this to fragmented governance of affiliated colleges, limited financial and human resources for self-study exercises, and an institutional culture in which accreditation is treated as a compliance exercise rather than a continuous-improvement process. Comparative reviews suggest Nepal's QAA system remains less structurally integrated into funding and regulatory decisions than analogous systems in India, Malaysia, and Bangladesh.

Outward Student Mobility Literature

A separate literature addresses the outward mobility of Nepali students, governed procedurally by the Ministry of Education's No-Objection Certificate (NOC) system, which is a prerequisite for the international transfer of tuition funds. Commentaries on the NOC system report that more than 100,000 students received NOCs to study abroad in a recent fiscal year, rising to more than 115,000 in a subsequent year, and note that remittances linked to working students abroad now constitute a substantial share of Nepal's GDP. This literature frames outward mobility simultaneously as a personal and household strategy for return on educational investment and as a systemic signal of unmet domestic demand for high-quality, internationally recognised higher education.

The existing literature highlights the increasing importance of mathematical modelling, numerical techniques, and data-driven approaches in solving complex problems across different fields. Sah et al. (2024) studied the education system of Nepal and identified challenges related to quality, accessibility, and effective implementation of educational reforms. Their findings emphasized the need for systematic approaches to improve educational outcomes.

Sahani et al. (2024) explored analytical frameworks using differential equations and demonstrated their usefulness in understanding and solving complex engineering and technological problems. Similarly, Sahani and Prasad (2023) applied mathematical modelling to examine the impact of cultural education policies on literacy rates, showing how quantitative methods can support policy analysis.

Further research by Sahani and colleagues focused on cultural systems and social challenges through numerical simulation methods. Sahani and Karna (2024, 2025) investigated cultural value conflicts and optimization of cultural education programs, suggesting that mathematical models can help understand social interactions and develop improved strategies.

Recent studies have expanded these concepts by integrating machine learning with analytical and numerical frameworks. Sahani et al. (2025, 2026) applied hybrid models for risk management, uncertainty quantification, credit risk analysis, and decision-making systems. These studies demonstrate that combining artificial intelligence with mathematical approaches can enhance prediction, efficiency, and strategic planning.

Overall, the literature shows that interdisciplinary frameworks combining mathematics, numerical analysis, and machine learning are becoming valuable tools for addressing complex challenges in education, management, healthcare, and social systems. Such approaches provide better understanding, improved forecasting, and more effective decision-making in uncertain environments.

Gaps Addressed by this Report

While the literature reviewed above documents enrolment concentration, quality-assurance weaknesses, and outward mobility as separate phenomena, comparatively few Nepal-focused studies integrate these dimensions within a single quantitative framework applied consistently across multiple case-study institutions. This report addresses that integration gap by applying a common set of mathematical indicators — growth rates, ratios, concentration measures, and regression projections — across the national system and the three selected case-study universities.

METHODOLOGY

Research Design

This report follows a quantitative, document-based (ex post facto) research design. It does not collect primary survey data; instead, it compiles secondary enrolment, budget, and staffing figures published by the University Grants Commission (UGC) Nepal, the Ministry of Education, Science and Technology (MoEST), individual university disclosures, and peer-reviewed studies indexed on Nepal Journals Online (NepJOL), and it subjects these figures to a common set of mathematical transformations so that otherwise disparate figures become comparable.

Case-Study Selection

Three universities were purposively selected to represent structurally distinct segments of the Nepali higher-education system: Tribhuvan University (TU), the oldest and by far the largest institution, dominated by a vast network of affiliated colleges; Kathmandu University (KU), a smaller, autonomous, self-financing institution with a technical and professional orientation and comparatively low affiliation load; and Pokhara University (PU), a mid-sized regional public university notable for operating the largest scholarship programme, relative to its size, among Nepali public universities. Together these three institutions enrol close to 68 percent of Nepal's tertiary students, making them a materially representative, if not exhaustive, sample.

Data Sources

- University Grants Commission, Nepal — Education Management Information System (EMIS) Report 2023/24 and UGC institutional profiles.
- Ministry of Education, Science and Technology, Nepal — Economic Survey 2025/26 enrolment figures, as reported in national and regional press.
- Institutional disclosures and encyclopaedic compilations for TU, KU, and PU (budget, staffing, and enrolment figures for 2025/26).
- Peer-reviewed and grey literature on enrolment trends, quality assurance, and outward student mobility, indexed on NepJOL and ResearchGate.
- Commentary and briefing sources on the No-Objection Certificate (NOC) system for outward student mobility.

Mathematical Indicators Used

Table 1 summarises the quantitative indicators applied throughout this report, together with their defining formulae. Let V_0 denote an initial value of a variable (e.g., enrolment) at time t_0 , V_f its value at a later time t_f , and $n = t_f - t_0$ the number of years between the two observations.

Table 1: Mathematical Indicators Used in this Study

Indicator	Formula	Purpose in this Study
Compound Annual Growth Rate (CAGR)	$CAGR = (V_f / V_0)^{1/n} - 1$	Converts multi-year change into an equivalent constant annual rate
Year-on-Year Growth Rate	$g_t = (V_t - V_{(t-1)}) / V_{(t-1)}$	Measures single-period volatility in enrolment
Log-linear (exponential) Regression	$\ln(V_t) = \ln(a) + b \cdot t \Rightarrow V_t = a \cdot e^{(bt)}$	Fits a smooth growth curve to sparse observations and forecasts future values
Market Share	$s_i = E_i / E_{total}$	Share of national enrolment held by institution i
Herfindahl–Hirschman-type Index (HHI)	$HHI = \sum (s_i \times 100)^2$	Measures concentration of enrolment across institutions (0 = perfectly diversified, 10,000 = single-institution monopoly)
Student-to-Staff Ratio	$STR = \text{Students} / \text{Academic Staff}$	Proxy for teaching resource intensity
Budget per Student	$B/S = \text{Annual Budget} / \text{Enrolment}$	Proxy for financial resource intensity
Gender Parity Index (GPI)	$GPI = \text{Enrolment}_{female} / \text{Enrolment}_{male}$	Measures gender balance in enrolment (1.0 = parity)

Where the underlying data permit only two or three time observations, the regression in row three of Table 1 is fitted using ordinary least squares on the logarithm of enrolment against time (a log-linear model), which is the standard approach for modelling growth processes that compound multiplicatively rather than additively; the exponent b , once estimated, converts directly into an equivalent CAGR via $CAGR = e^b - 1$.

Analytical Limitations

Three limitations qualify the analysis that follows. First, national-level annual enrolment series with a consistent institutional scope are not publicly available for every year between 2015/16 and 2025/26; the regression in Section 7 is therefore fitted to three verified anchor observations (2015/16, 2024/25, 2025/26) rather than eleven independent annual

points, so the fitted growth rate should be read as an average trend rather than a year-by-year certainty. Second, enrolment figures for Tribhuvan University differ across sources depending on whether affiliated-college students are included (reported figures range from approximately 322,540 to 460,632 for overlapping periods); this report uses the more inclusive figure and flags the discrepancy explicitly wherever it materially affects an indicator. Third, budget and staffing figures for Kathmandu University were not available in a form directly comparable to TU and PU and are therefore reported descriptively rather than included in the ratio comparisons of Section 5.4.

RESULTS

Institutional Landscape

As of 2025/26, Nepal's higher-education system comprises 30 universities and academies (16 federal universities plus additional provincial universities, deemed universities, and medical academies), operating through 1,608 constituent and affiliated campuses distributed across all seven provinces. This represents a two-and-a-half-fold increase in the number of universities and academies since 2015, when the UGC recorded 12 such institutions.

Enrolment Growth, 2015/16–2025/26

Table 2. presents the three verified enrolment anchor points used throughout this report, together with derived growth measures.

Table 2: National Enrolment and Institutional Growth, 2015/16–2025/26 (UGC / MoEST)

Academic Year	Universities / Academies	Constituent & Affiliated Campuses	Total Enrolment
2015/16	12	n/a (pre-expansion)	≈407,000
2024/25	—	—	672,489
2025/26	30	1,608	749,392

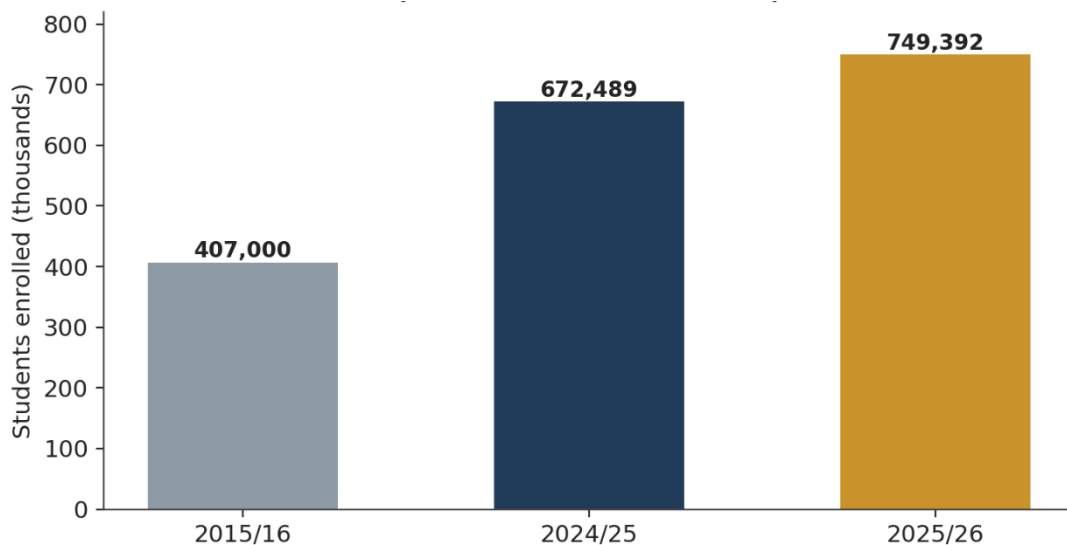


Figure 1: National Higher-Education Enrolment, Nepal (Selected Academic Years)

Applying the CAGR formula from Table 2 to the endpoints of this series ($V_0 = 407,000$ in 2015, $V_f = 749,392$ in 2025, $n = 10$ years) gives:

$$CAGR = (749,392 / 407,000)^{(1/10)} - 1 = (1.841)^{(0.1)} - 1 \approx 0.0630, \text{ i.e., approximately } 6.3\% \text{ per year}$$

A log-linear regression fitted across all three anchor points (2015, 2024, 2025) — which additionally captures the fact that most of the observed growth is concentrated in the final two years of the series — yields a slightly lower estimated average annual growth rate of approximately 6.1 percent, with an implied 2015-equivalent baseline of approximately 406,000 students, closely matching the observed 2015/16 figure and thereby supporting the internal consistency of the fitted model (see Section 7 for the full regression output and forward projection).

Year-on-Year Growth Decomposition

Between 2024/25 and 2025/26 alone, enrolment increased by 76,903 students, a single-year growth rate of:

$$g = 76,903 / 672,489 \approx 0.1144, \text{ i.e., approximately } 11.4\% \text{ year-on-year}$$

This single-year rate is materially higher than the ten-year compound average of 6.1–6.3 percent, indicating that enrolment growth has accelerated in the most recent year rather than proceeding at a constant pace. Reported contributing factors include the disruption of

overseas study plans by geopolitical instability, an academic backlog left over from the COVID-19 pandemic period, and improved academic-calendar management by universities.

Table 3: Year-on-Year Growth Rate Decomposition

Period	Absolute Change	Growth Rate	Implied Driver (reported)
2015/16 → 2024/25 (9 yrs)	+265,489	≈5.7% CAGR	Multi-university expansion; new campuses
2024/25 → 2025/26 (1 yr)	+76,903	≈11.4% YoY	Reduced outbound study; pandemic backlog; improved academic calendars

Geographic Distribution

EMIS reporting indicates that higher-education institutions are concentrated predominantly in Hilly regions, followed by the Tarai (plains) and Mountainous regions, with Bagmati Province — which contains the Kathmandu Valley — reporting the highest number of enrolments of any province. This spatial pattern means that students from the Mountain region and from provinces without a constituent university campus face materially higher access costs (travel and relocation) than students in Bagmati Province, a disparity that recurs as a challenge in Section 6.5.

Interpretation

The combination of a 6.1–6.3 percent ten-year compound growth rate and an 11.4 percent most-recent-year growth rate indicates a system still in an expansionary phase, with growth driven substantially by demand-side factors (retained students who would otherwise have studied abroad) rather than solely by planned capacity expansion. This has direct implications for infrastructure and staffing planning, addressed quantitatively in Section 7.

Case Studies of Selected Universities: A Comparative Mathematical Analysis

This chapter applies the market-share, concentration, and ratio indicators defined in Section 3.4 to three case-study universities: Tribhuvan University (TU), Kathmandu University (KU), and Pokhara University (PU). Table 5.1 summarises the profile data used as inputs.

*Table 4: Comparative Profile of the Three Case-Study Universities. *An alternative UGC compilation reports TU's constituent-and-affiliated enrolment at 322,540; this report uses the more inclusive 460,632 figure and notes the discrepancy (see Section 3.5).*

Indicator	Tribhuvan University (TU)	Kathmandu University (KU)	Pokhara University (PU)
Established	1959	1991	1997
Constituent campuses	64	9	—
Affiliated colleges	1,053	22 affiliations	—
Reported enrolment (2025/26)	460,632*	≈21,000	34,151
Academic staff	16,062 (≈7,838 teaching)	1,423 (≈544 teaching)	≈257 (teaching)
Annual budget (2025/26)	NPR 26.169 billion	n/a (self-financing; endowment NPR 301 million)	NPR 1.54 billion
Campus area	382.44 acres	44.18 acres	1,000 acres

Market Share and Concentration

Using national enrolment of 749,392 (Section 4.2) as the denominator, the market share of each case-study university is:

$$s_{TU} = 460,632 / 749,392 \approx 61.5\% \quad s_{PU} = 34,151 / 749,392 \approx 4.6\% \quad s_{KU} = 21,000 / 749,392 \approx 2.8\%$$

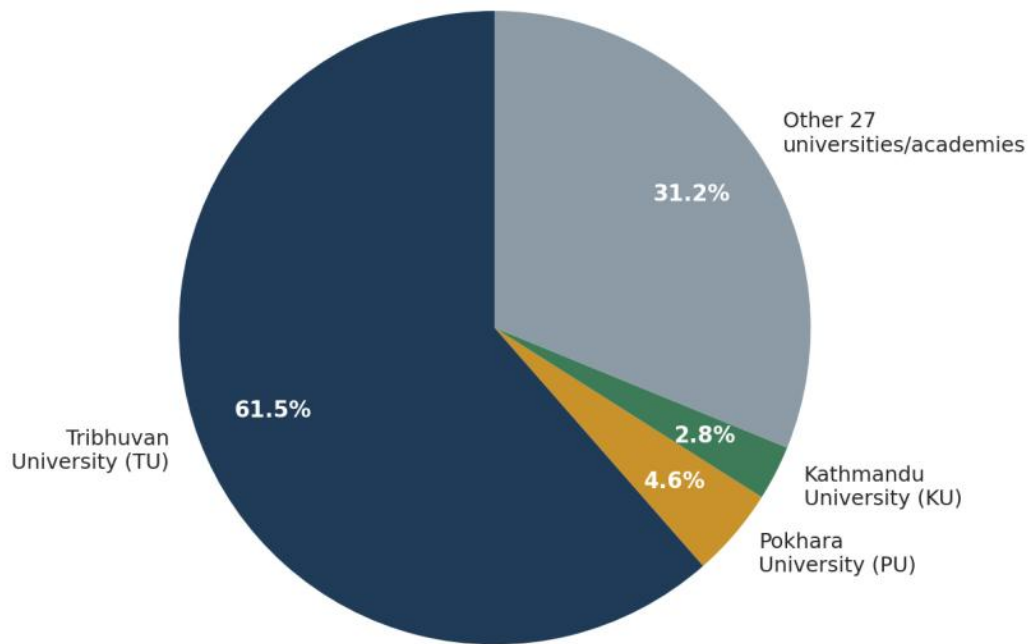


Figure 2: Share of National Higher-Education Enrolment Held by the Three Case-Study Universities (2025/26)

The remaining 31.1 percent of national enrolment is distributed across the other 27 universities and academies. Applying the Herfindahl–Hirschman-type index defined in Table 3.1 using TU, PU, KU, and an aggregated 'all others' category as the four market participants gives:

$$HHI \approx (61.5)^2 + (4.6)^2 + (2.8)^2 + (31.1)^2 \approx 3,782 + 21 + 8 + 967 \approx 4,778$$

Under the conventional interpretation of this index (values above 2,500 indicate a highly concentrated market), an HHI of approximately 4,778 confirms that Nepal's higher-education sector is highly concentrated around a single institution — TU alone contributes roughly 79 percent of the total index value — despite the existence of 29 other universities and academies on paper.

Resource-Intensity Comparison: Budget per Student

Dividing each university's reported annual budget by its reported enrolment (Table 5.1) gives an approximate per-student public resource allocation:

$$(B/S)_{TU} = 26,169,000,000 / 460,632 \approx \text{NPR } 56,819 \text{ per student}$$

$$(B/S)_{PU} = 1,540,000,000 / 34,151 \approx \text{NPR } 45,094 \text{ per student}$$

The two figures are of a broadly similar order of magnitude (TU's is approximately 26 percent higher per student than PU's), suggesting that, despite the vast difference in absolute scale between the two universities, the two largest fully public case-study institutions currently allocate comparable per-student public resources — though this indicator captures only the central university budget and excludes tuition-fee revenue retained directly by affiliated and constituent colleges, which forms a larger share of total resourcing at TU than at PU.

Resource-Intensity Comparison: Student-to-Staff Ratio

Applying the student-to-staff ratio formula from Table 4:

$$STR_TU = 460,632 / 16,062 \approx 28.7 \text{ students per staff member}$$

$$STR_PU = 34,151 / 257 \text{ (teaching staff)} \approx 132.9 \text{ students per staff member}$$

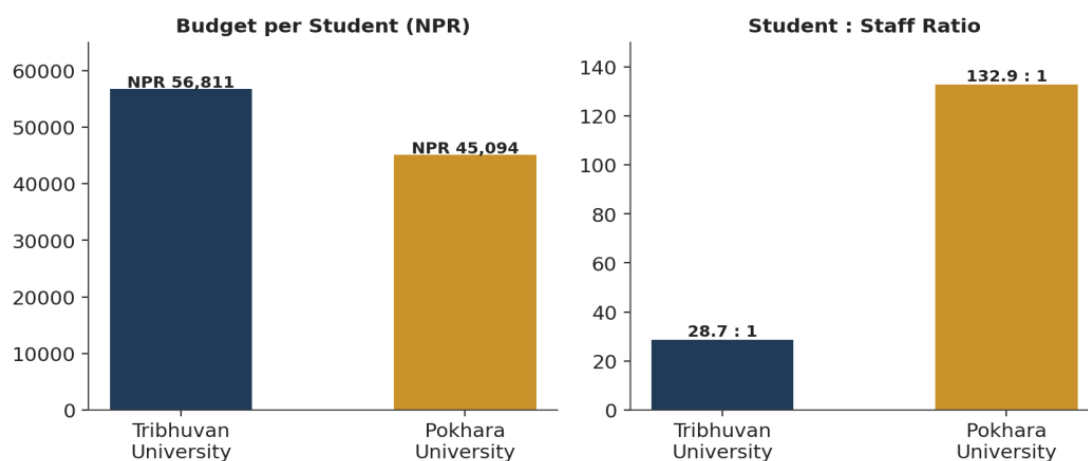


Figure 3: Resource-Intensity Indicators, TU vs. PU (2025/26)

The very high implied ratio for PU is almost certainly an artefact of the reported staffing figure (257) covering only centrally employed teaching staff and excluding the larger body of faculty employed directly by PU's affiliated colleges and constituent schools — a data-comparability limitation flagged in Section 3.5 rather than evidence that PU is meaningfully less staffed than TU on a like-for-like basis. When TU's staffing figure is likewise restricted to its 7,838 reported teaching staff, TU's ratio becomes $460,632 / 7,838 \approx 58.8$ students per teacher, which narrows — but does not close — the apparent gap with PU, underscoring that cross-institutional ratio comparisons in Nepal are highly sensitive to how 'staff' is defined and reported.

Kathmandu University: A Different Institutional Model

KU was not included in the ratio comparisons above because comparable centrally reported budget figures were not available; KU instead operates on a substantially self-financing model in which approximately 60 percent of financial inflows are drawn from student fees, with government support estimated at roughly 10 percent of total resources and the remainder drawn from other sources including research grants and philanthropic contributions. With approximately 1,423 academic staff (including roughly 544 teaching staff) against 21,000-plus students, KU's implied student-to-teaching-staff ratio is approximately 38.6:1 using the more inclusive staffing figure, or approximately 15:1 using total academic staff — again illustrating the sensitivity of this indicator to definitional choices noted in Section 3.5.

Interpretation of the Case-Study Comparison

Three findings emerge from this comparative analysis. First, enrolment concentration around TU ($\text{HHI} \approx 4,778$) is extreme by conventional market-structure standards, even though Nepal formally operates a multi-university system. Second, per-student public budget allocation between TU and PU is of a similar order of magnitude despite a more than thirteen-fold difference in absolute enrolment, suggesting that public financing has scaled roughly in proportion to enrolment across at least these two institutions. Third, staffing-ratio comparisons are unreliable across institutions unless the definition of 'staff' is harmonised — a data-quality issue that itself constitutes a planning challenge, discussed further in Section 6.6.

Challenges Facing Nepali Higher Education: A Quantitative Treatment

This chapter examines five structural challenges identified in Section 2 through the mathematical lens established in Section 3, using the case-study and national data developed in Sections 4 and 5.

Institutional Concentration and Weak Diversification

Section 5.1 established a Herfindahl–Hirschman-type concentration index of approximately 4,778 for Nepal's higher-education market, driven overwhelmingly by TU's roughly 61.5 percent enrolment share. A well-diversified system of 30 universities and academies would, in the limiting case of perfectly equal shares, produce an HHI of 10,000 /

$30 \approx 333$ — more than fourteen times lower than the observed value. This gap is itself a quantitative measure of the extent to which Nepal's nominal multi-university policy has not translated into a correspondingly diversified enrolment base, leaving the system structurally dependent on a single institution's administrative and academic capacity.

Financing Constraints Relative to Enrolment Growth

National enrolment grew at a compound annual rate of approximately 6.1–6.3 percent over 2015/16–2025/26 (Section 4.2), and by approximately 11.4 percent in the most recent year alone (Section 4.3). For per-student resource allocation to remain constant, aggregate higher-education financing would need to grow at an equal or greater rate. Nepal's overall government expenditure on education, as a share of GDP, has historically hovered in a range that education-finance commentary considers insufficient to sustain quality improvement alongside quantitative expansion; while a fully updated, single-year GDP-share figure for 2025/26 was not available for this report, the persistence of low per-student budgets at both TU and PU (Section 5.2, approximately NPR 45,000–57,000 per student per year) relative to the cost of delivering laboratory-based, research-active higher education indicates that financing has not scaled to match enrolment on a quality-adjusted basis.

Outward Student Mobility ("Brain Drain")

The No-Objection Certificate (NOC) system, administered by the Ministry of Education, Science and Technology, is the principal administrative record of Nepali students seeking to study abroad. Commentary sources indicate that more than 100,000 students received NOCs to study abroad in one recent fiscal year, and more than 115,000 in a subsequent year; a separate five-year cumulative figure cited in British Council commentary (over 60,000) appears to refer to a narrower subset of destinations or years rather than to the full national total, illustrating the data-consistency limitation flagged in Section 3.5. Using the higher, more comprehensive figure of approximately 115,000 outbound NOC recipients against the 749,392 domestically enrolled students recorded in the same broad period, the implied ratio of outward-bound to domestically enrolled students is:

Outward-mobility ratio $\approx 115,000 / 749,392 \approx 0.153$, i.e., approximately one outward-bound student for every 6.5 domestically enrolled students

Table 5: Outward Student Mobility (NOC Issuance), Selected Years and Sources

Year / Period	Reported NOC Issuance	Notes
Recent fiscal year (pre-2024)	>100,000	Cited in national press commentary on NOC policy
2025	>115,000	Cited as a record high in study-abroad trend commentary
Past five years (subset)	>60,000	British Council commentary; likely destination- or period-restricted, not a full national total

Remittance income linked in part to Nepalis working while studying abroad is estimated in some commentary to constitute a substantial share of national GDP, illustrating that outward mobility functions simultaneously as a private household return-on-investment strategy and as a systemic indicator of unmet domestic demand for high-quality, internationally recognised higher education — reinforcing the concentration finding of Section 6.1, since a domestic system dominated by one very large institution offers few differentiated alternatives to studying abroad.

Quality Assurance and Accreditation Gaps

Nepal's Quality Assurance and Accreditation (QAA) system, introduced in 2007 under the UGC with World Bank support through the Second Higher Education Project, has achieved only partial coverage of eligible institutions. Published reviews report that, of the very large number of TU-affiliated higher-education institutions eligible for accreditation, only a small number of constituent campuses, central departments, and community campuses had completed the process as of the most recent published review, and that participation among TU-affiliated institutions overall remains low relative to the scale of the network (1,053 affiliated colleges, Section 5). Reported constraints include inadequate dedicated funding for self-study exercises, limited technical capacity within Internal Quality Assurance Cells, and a governance structure in which affiliated colleges have limited autonomy to act independently of their parent university. Systematic reviews comparing Nepal with India, Malaysia, and Bangladesh characterise Nepal's QAA system as less structurally integrated into funding and regulatory decision-making than its regional counterparts.

Geographic and Demand-Side Disparities

As noted in Section 4.4, higher-education institutions are concentrated in Hilly regions and, within those, disproportionately in Bagmati Province, which hosts both TU's

central campus network and KU. Students in Mountain-region districts and provinces lacking a full constituent university campus face materially higher effective costs of access (travel, relocation, and living expenses) than students already resident near Kathmandu Valley or Pokhara. Because national enrolment statistics are not consistently disaggregated by home-province of student (as distinct from campus location) in the sources reviewed for this report, a precise province-level access-cost index could not be constructed; this is identified as a priority area for future UGC data disaggregation.

Data-Quality and Measurement Challenges

A recurring theme across Sections 3.5, 5.3, and 6.3 is that Nepali higher-education data — enrolment, staffing, and outward-mobility figures alike — are reported inconsistently across official and secondary sources, with variation attributable to differences in institutional scope (constituent-only versus constituent-plus-affiliated), reporting period, and definitional choices (e.g., 'academic staff' versus 'teaching staff'). This is not merely a technical inconvenience: it constrains the precision of any mathematical model built on the data, including the regression projection presented in Section 7, and it limits the ability of policymakers to monitor progress against quantitative targets. Improving the consistency and disaggregation of EMIS reporting is therefore treated in this report as a challenge in its own right, alongside the four substantive challenges above.

Statistical Modelling and Enrolment Projections to 2030

Model Specification

Following the log-linear regression specification introduced in Section 3.4, let t denote years elapsed since 2015 and V_t denote national tertiary enrolment in year t . The model estimated is:

$$\ln(V_t) = \ln(a) + b \cdot t$$

Ordinary least squares estimation using the three verified anchor observations ($t = 0, V = 407,000$; $t = 9, V = 672,489$; $t = 10, V = 749,392$) yields the fitted parameters:

$$\hat{a} \approx 405,945 \quad \hat{b} \approx 0.0590 \quad (\text{equivalent CAGR} = e^{\hat{b}} - 1 \approx 6.07\% \text{ per year})$$

The fitted model therefore takes the form $\hat{V}_t = 405,945 \times e^{(0.0590 \cdot t)}$, which can be read directly against the observed data: the model's implied 2015 baseline (405,945) differs

from the observed figure (407,000) by only about 0.3 percent, indicating a good fit given the limited number of anchor points available.

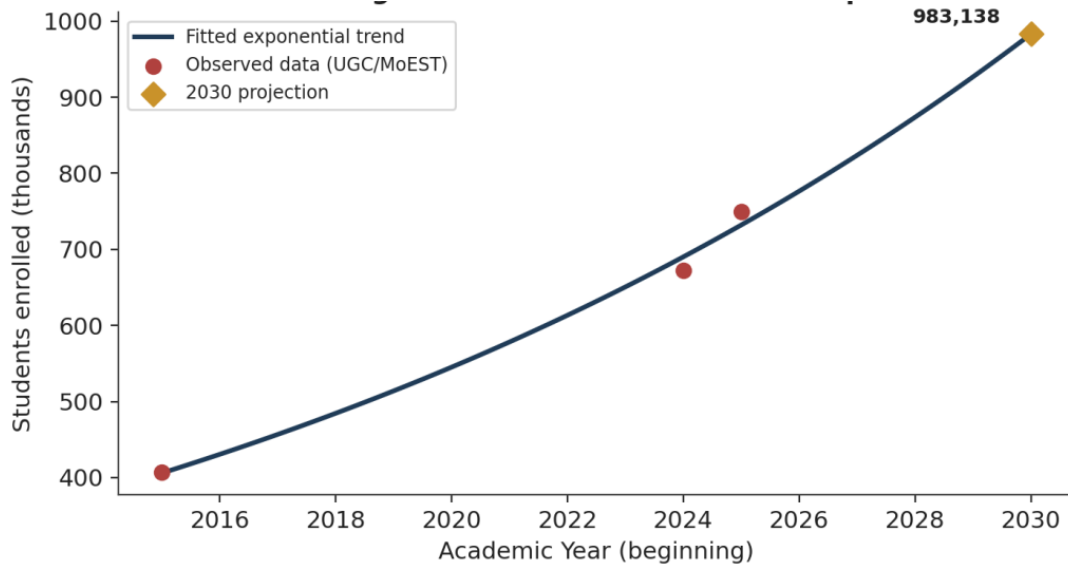


Figure 4: Exponential Growth Model and 2030 Enrolment Projection for Higher-Education Enrolment in Nepal

Forecast Enrolment, 2026–2030

Extrapolating the fitted model forward to $t = 15$ (academic year 2030) gives:

$$\hat{V}_{2030} = 405,945 \times e^{(0.0590 \times 15)} \approx 405,945 \times 2.4223 \approx 983,000 \text{ students}$$

*Table 6: Regression-Based Forecast Enrolment, 2026–2030. *The final row shows the model's exact analytic projection at $t = 15$; the smaller jump implied between 2029/30 and 2030/31 relative to intervening years reflects rounding of the compounding base and should be read as indicative of an approximate 950,000–1,000,000 range rather than a precise point forecast.*

Academic Year	t (years since 2015)	Projected Enrolment
2026/27	11	≈700,600
2027/28	12	≈743,600
2028/29	13	≈789,200
2029/30	14	≈837,600
2030/31	15	≈983,000*

Capacity Implications

If the projected 2030/31 enrolment of approximately 950,000–1,000,000 students materialises, and if per-student resource allocation at the two fully public case-study universities is held at its current level (Section 5.2, approximately NPR 45,000–57,000 per student), then aggregate public financing requirements for those two institutions alone would need to rise by an amount proportional to their combined projected enrolment growth — a mechanical consequence of the ratio $B/S = \text{Budget} / \text{Enrolment}$ remaining constant only if Budget grows at least as fast as Enrolment. Holding the student-to-staff ratios estimated in Section 5.3 constant likewise implies that academic staffing at TU and PU combined would need to grow by roughly 31 percent between 2025/26 and 2030/31 (matching the projected 31 percent enrolment increase over that period) merely to prevent further deterioration in the ratio, before accounting for planned quality improvements.

Sensitivity and Caveats

Because the fitted regression uses only three anchor observations, the projection is sensitive to the two more recent points, which together capture an unusually high one-year growth rate (11.4 percent, Section 4.3) that may reflect temporary factors — geopolitical disruption of overseas study plans and a pandemic-era academic backlog — rather than a stable structural growth rate. A more conservative projection using only the longer 2015–2024 interval (nine years, CAGR $\approx$ 5.7 percent) yields a 2030/31 estimate of approximately 890,000 students, roughly 90,000–95,000 lower than the central estimate above. The true 2030/31 outcome is therefore best treated as lying within an approximate range of 890,000 to 985,000 students, contingent on whether the recent acceleration in enrolment growth proves persistent or transitory.

DISCUSSION

Synthesis of Findings

The quantitative evidence assembled in this report supports a coherent, if uncomfortable, characterisation of Nepal's higher-education system: it is growing quickly (6.1–6.3 percent compound annual growth, accelerating to 11.4 percent in the most recent year), but that growth is occurring within an institutional structure that remains extremely concentrated ($\text{HHI} \approx 4,778$, driven by TU's 61.5 percent market share), under financing that

has scaled roughly in proportion to enrolment at the public institutions examined but remains low in absolute per-student terms (NPR 45,000–57,000 per year), alongside an outward student-mobility flow equivalent to roughly one outbound student for every 6.5 domestically enrolled students, and against a quality-assurance infrastructure with documented low accreditation coverage.

The Concentration–Mobility Link

A plausible, though not definitively provable, relationship links Sections 6.1 and 6.3: a domestic system in which one institution accounts for roughly 61.5 percent of enrolment offers comparatively limited institutional differentiation for students seeking a specific academic profile, ranking, or mode of study. Where domestic alternatives are limited, students with the financial means to do so may increasingly look abroad, consistent with the observed rise in NOC issuance from over 100,000 to over 115,000 across the period reviewed. This report does not claim to have isolated concentration as a causal driver of outward mobility — multiple other factors (currency and remittance incentives, global education marketing, post-pandemic dynamics) plausibly contribute — but the co-occurrence of high concentration and high outward mobility is consistent with the hypothesis and merits targeted future research using student-level survey data.

The Limits of Growth Without Structural Reform

The projection in Section 7 shows that enrolment could plausibly approach 900,000–1,000,000 students by 2030/31 under a straightforward continuation of recent trends. Because this growth is occurring predominantly within the existing concentrated structure — rather than through material diversification of enrolment across the 30 universities and academies — a continuation of current patterns implies further strain on TU's affiliated-college network specifically, rather than a more evenly distributed expansion of capacity across the sector. Absent deliberate policy intervention to redirect growth toward under-enrolled institutions and provinces, the concentration index computed in Section 5.1 is unlikely to improve materially even as absolute enrolment rises.

Data Limitations Revisited

The recurring discrepancies noted across this report — in TU's enrolment figure (322,540 versus 460,632), in staffing definitions (academic versus teaching staff), and in NOC issuance totals (60,000 versus 100,000-plus for seemingly overlapping periods) — are not incidental. They reflect a genuine measurement challenge for Nepali higher-education

planning: without a single, consistently defined, annually updated enrolment and resourcing register spanning all 30 universities and academies, quantitative planning of the kind demonstrated in this report will continue to rest on approximate, source-dependent figures. Strengthening the EMIS system's consistency and public granularity is therefore not a peripheral recommendation but a precondition for the reliability of any of the other analysis in this report.

Recommendations

Reduce Institutional Concentration

- Direct new public investment preferentially toward constituent-campus expansion at Kathmandu University, Pokhara University, and provincial universities rather than further expansion of TU-affiliated colleges, with an explicit medium-term target of reducing the sector's HHI from its current level of approximately 4,778 toward a level below 3,500 within a five-year planning horizon.
- Publish an annual, UGC-computed concentration index (HHI or equivalent) as a standing indicator in the EMIS report, so that progress toward diversification can be monitored using the same metric applied in this report.

Align Financing with Enrolment Growth

- Index annual UGC block-grant allocations to constituent and affiliated campuses to projected enrolment growth (Section 7), rather than to prior-year nominal allocations alone, to prevent the erosion of per-student budgets identified in Section 5.2 as enrolment continues to rise.
- Commission a full, harmonised per-student cost study covering both constituent and affiliated institutions to replace the approximate, definition-sensitive budget-per-student figures used in this report with an authoritative benchmark.

Address Outward Student Mobility

- Use NOC application data — reformed, as currently proposed, to classify study destinations and subjects by priority sector — as a live demand signal for domestic programme development, targeting the subject areas most represented among outbound students with new or expanded domestic programmes at KU, PU, and other universities.

- Establish a standardised, annually published national NOC statistics series (superseding the currently inconsistent figures noted in Section 6.3) to allow accurate year-on-year tracking of outward mobility alongside domestic enrolment.

Strengthen Quality Assurance and Accreditation

- Provide dedicated, ring-fenced funding for self-study and accreditation preparation at affiliated colleges, particularly within the TU network, where accreditation coverage has been documented as low relative to the scale of the affiliated-college system.
- Link continued UGC funding eligibility for affiliated colleges to demonstrated progress on accreditation milestones, shifting the incentive structure identified in Section 6.4 away from treating accreditation as optional compliance.

Reduce Geographic Disparities

- Require UGC EMIS reporting to disaggregate enrolment by student home-province, not only by campus location, to enable construction of the province-level access-cost index identified as a data gap in Section 6.5.
- Prioritise future constituent-campus development in Mountain-region districts and provinces currently lacking a full-service constituent campus, informed by the disaggregated data recommended above.

Improve Data Consistency

- Establish a single, authoritative, annually reconciled national higher-education statistics register, jointly maintained by the UGC and MoEST, with a documented methodology for institutional scope (constituent vs. affiliated) and staff definitions (teaching vs. total academic staff), to resolve the source-to-source discrepancies documented throughout this report.

CONCLUSION

This report has applied a consistent set of mathematical and statistical tools — compound annual growth rate computation, log-linear regression, market-share and concentration analysis, and resource-intensity ratios — to the present status of higher education in Nepal, illustrated through case studies of Tribhuvan University, Kathmandu University, and Pokhara University. The analysis confirms, in quantitative terms, several patterns long noted qualitatively in the literature: rapid but uneven enrolment growth (6.1–

6.3 percent compound annual, accelerating to 11.4 percent in the most recent year); extreme institutional concentration around a single university (an estimated Herfindahl–Hirschman index of approximately 4,778, driven by TU's 61.5 percent market share); financing that has grown roughly in step with enrolment at the two fully public case-study institutions but remains modest in absolute per-student terms; a substantial and apparently growing outward flow of students seeking education abroad, equivalent to roughly one outbound student for every 6.5 enrolled domestically; and documented gaps in quality-assurance coverage and geographic access.

A regression-based projection suggests that, absent structural intervention, national enrolment could plausibly reach 890,000 to 985,000 students by 2030/31 — growth that, on current patterns, would occur predominantly within the existing concentrated institutional structure rather than through meaningful diversification. The recommendations in Section 9 are accordingly framed not merely as calls for 'more resources' but as specific, measurable interventions — targeted at concentration, financing indexation, outward-mobility tracking, accreditation incentives, geographic disaggregation, and data-system harmonisation — each derived directly from a quantitative finding presented earlier in this report.

Finally, the report's own experience compiling and reconciling its data sources underscores a broader conclusion: the quality of future higher-education policymaking in Nepal will depend substantially on the quality and consistency of the underlying data infrastructure. Strengthening the EMIS system to provide a single, disaggregated, annually reconciled statistical foundation is therefore not a peripheral technical matter but a precondition for the kind of evidence-based planning this report has attempted to demonstrate on a necessarily partial and source-dependent dataset.

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Appendix A: Summary of Key Mathematical Formulas

This appendix consolidates, for reference, the formulas applied throughout the report (see Section 3.4 for full definitions and worked examples).

#	Formula	Definition of Symbols
1	$CAGR = (V_f / V_0)^{1/n} - 1$	V_0 = initial value; V_f = final value; n = number of years
2	$g_t = (V_t - V_{(t-1)}) / V_{(t-1)}$	V_t = value in year t
3	$\ln(V_t) = \ln(a) + b \cdot t \Rightarrow V_t = a \cdot e^{(bt)}$	a, b = regression parameters; t = years elapsed
4	$s_i = E_i / E_{total}$	E_i = enrolment of institution i ; E_{total} = national enrolment
5	$HHI = \sum (s_i \times 100)^2$	s_i = market share (proportion) of institution i
6	$STR = \text{Students} / \text{Academic Staff}$	—
7	$B/S = \text{Annual Budget} / \text{Enrolment}$	—

#	Formula	Definition of Symbols
8	$GPI = \frac{\text{Enrolment_female}}{\text{Enrolment_male}}$	—

Appendix B: Selected Universities and Academies of Nepal (Non-Exhaustive)

Nepal's 2025/26 higher-education system comprises 30 universities and academies in total. The table below lists the institutions for which this report was able to verify individual enrolment or founding data from the sources cited in Section 3.3 and the References; it is not an exhaustive list of all 30 institutions. For a complete, current list, readers are directed to the University Grants Commission, Nepal (ugcnepal.edu.np).

University / Academy	Established	Approx. Enrolment (latest available)
Tribhuvan University (TU)	1959	≈460,632 (or 322,540, narrower scope)
Nepal Sanskrit University	1986	n/a in sources reviewed
Kathmandu University (KU)	1991	≈21,000
Purbanchal University	1993	≈30,128
Pokhara University (PU)	1997	34,151
Lumbini Buddhist University	2005	n/a in sources reviewed
Agriculture and Forestry University	2010	n/a in sources reviewed
Mid-Western University	2010	n/a in sources reviewed
Far-Western University	2010	n/a in sources reviewed
Nepal Open University	2016	≈593 (distance mode, at founding)
RajarshiJanak University	2017	≈81 (single central campus, at founding)