

Higher Education Landscape in India: Government Expenditure and Its Implications on Growth and Access

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Abstract

India's higher education system grapples with myriad challenges perpetuated by scarcity of resources. This study seeks to analyse the quantitative growth of India's higher education since independence, particularly focusing on the post-reform period. The research employs regression models, including the semi-log, Gompertz and multiple linear models, to determine growth rates and forecast variables up to 2035. The study reveals a significant expansion of higher education during the examined period, though it falls short of meeting the increasing demands. To achieve the goal of a 50 per cent Gross Enrollment Ratio (GER) by 2035, the Government of India must take steps to boost its expenditure on higher education. The analysis powerfully underscores that despite the extensive proliferation of higher education in India, its efficacy might be limited without concurrent implementation of robust policies directed towards amplifying government expenditure within the sector.

Keywords: Higher Education; Access; Gross Enrollment Ratio (GER); Dropout Enrollment Ratio (DER); Government Expenditure; India

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Introduction

Achieving success in today's expanding knowledge economy requires a robust and equitable higher education system that fosters excellent learning through a combination of quality teaching and research. This is widely recognised as a critical element for the successful transformation of emerging economies into 21st-century knowledge-based economies. Therefore, it is imperative for developing nations to place significant importance on the integration of higher education, both in terms of quality and quantity (Prakash, 2007a). Furthermore, this emphasis on higher education contributes to poverty alleviation, long-term development, and progress towards globally agreed-upon development objectives such as the 'Millennium Development Goals' (MDGs) and 'Education for All' (UNESCO, 2009a).

Higher education in India has been driven by ambitious goals to maximise human resource potential. However, the commitment to ensure equity and access has not been as pronounced. Establishing an adequate number of higher educational institutions is vital to expanding opportunities, particularly for vulnerable sections of society. The significance of this provision was emphasised by the University Grants Commission (UGC) in 2011. Since the 1950s, India's planning strategies have aimed at addressing regional disparities and discriminations, focusing on achieving distributive equity in social service provision. However, these strategies underwent a shift with the introduction of comprehensive Economic Policy Reforms in 1991.

After implementing Economic Policy Reforms, the Indian economy has increasingly relied on the private sector to provide socio-economic amenities. Significant shifts in the financial landscape of India's higher education sector have been evident since adopting these policy reforms. This has led to a fundamental change in the financing model, transitioning from state support to private-sector funding in higher education (Tilak, 2004; Rani, 2022). The

heightened influence of market forces has diminished the emphasis on the distributional aspect, particularly concerning the provision of higher education across all segments of society (Carnoy, 1999). These transformations have presented challenges in terms of access, equity, and quality within the higher education sector. This sector is anticipated to play an increasingly crucial role in enhancing the nation's competitiveness in the evolving global knowledge economy (Prakash, 2007b).

Despite substantial economic growth since independence, India continues to grapple with limited access to higher education, particularly within underprivileged communities. Regrettably, the nation lacks a comprehensive database to analyse the trajectory of its higher education system over the past 75 years. With a specific focus on expanding higher education, the current study aims to delve into the socio-historical evolution of higher education in India since independence, with special emphasis on the post-reform period. Furthermore, it attempts to identify the factors affecting Gross Enrollment Ratio (GER) in the nation's higher education sector. The study also aims to illuminate the relevance of government funding in expanding higher education in India. While endeavouring to construct a database illustrating the growth of higher education, it also seeks to forecast the growth of higher education till 2035, considering the perspective of NEP-2020. It also provides recommendations on critical contemporary issues related to higher education in India, including government expenditure and access.

The present study is outlined in three main sections. The first section deals with the growth of higher education in India since 1950, with special reference to 1991. The next section discusses the importance of public funding in enhancing access to higher education in India. Finally, the study observations are discussed in the concluding section.

History of Higher Education in India

Higher Education in Pre-Independent India

India's history of higher education dates back to ancient times, demonstrating a commitment to maintaining high standards in disseminating knowledge. Esteemed educational centres such as Nalanda (Bihar), Takshashila (Punjab, now in Pakistan), Vikramshila (Bihar), and Vallabhi (Gujarat) attracted students globally, including students from China, Tibet, Nepal, and Korea. These institutions were established in diverse environments to facilitate knowledge exchange across cultures (Khemani & Narayan, 2006). The Gurukul education system was not driven by economic necessity but instead catered to an exclusive group of intellectuals who played a crucial role in promoting societal order and contributing to efficient national administration (Aruchami, 2003).

Despite its illustrious history, higher education in India suffered a significant setback with the advent of the British education system (Perkin, 2006). The colonial system aimed to replicate English culture, with courses tailored to the preferences of the English aristocratic rulers. The 'Minutes' of 1823 by Mount Stuart Elphinstone laid the foundation for India's current higher education system, emphasising establishing institutions for teaching English and European Sciences (Varma, 1970-71- 1971-72). Elphinstone College in Bombay, founded in 1834, played a crucial role in preparing individuals for high positions in the civil administration of India (Powar, 2002a). In 1835, Macaulay's minutes¹ were accepted, declaring the British government's goal to promote European

Literature and Science among the natives of India (Sharp, 1920). Sir Charles Wood's 1854 letter, known as the 'Magna Carta of English Education in India',² proposed the establishment of universities in India modelled after the London University, leading to the founding of universities in Calcutta, Madras, and Bombay in 1857 (Gol, 1950). The number of colleges increased from 27 to 75 over the next 25 years, and the University of Allahabad was established in 1887 due to the growing demand for new universities. By 1923, there were a total of 12 universities, and the Inter-University Board later renamed the Association of Indian Universities in 1973, was formed in 1925 to enhance the coordination of these institutions (Powar, 2002b). Subsequent years saw steady growth, prompting the need for a comprehensive plan for educational development by 1943. The Sargent Report of 1944,³ a Central Advisory Board of Education report on Post War Educational Development in India, marked the first attempt to formulate a national education system. The report highlighted the failure to align university education with community needs and proposed improvements (Mohanty, 1993). One of the Sargent Commission's recommendations was the creation of the University Grants Commission in 1945, initially tasked with the three central universities of Aligarh, Banaras, and Delhi. Empowered in 1947 to oversee all universities, it remained a recommendatory body without financial resources at its disposal (Powar, 2012a).

Higher Education in Post-Independent India

The system of education crafted by the British was institutionalised after independence, with

¹Thomas Babington Macaulay's "Minute on Indian Education" of 1835 was instrumental in augmenting the spread of the English language in the Indian education system during the era of British governance, where he advocated for the establishment of an English educational framework designed to cultivate a cohort of Indians who possessed "Indian lineage and appearance, yet embraced English sensibilities, viewpoints, ethics, and intellect" (Sharp, 1920, p. 116).

²During Lord Dalhousie's tenure as Governor-General, Sir Charles Wood presented his Educational Despatch on 19 July 1854, recommending a comprehensive scheme for public education overseen, funded, and partly managed by

the government. This endeavour led to the establishment of the University of Calcutta, the University of Bombay, and the University of Madras in 1857 in India (Khan, 2001).

³ The Sargent Report, formally known as the Central Advisory Board of Education Report, was presented to the Viceroy's Executive Council Reconstruction Committee in 1944, alongside a Memorandum from India's Education, Health, and Lands Department. Organised into 12 chapters, this report discussed various aspects of education within a modern and democratic framework, covering primary, secondary, and university education (Sargent, 1948).

classroom teaching followed by an examination-dominated university system. It was only after gaining independence that the Government of India focused on both qualitative and quantitative expansion of higher education and constituted a number of committees to oversee the development of higher education. The evolution of India's higher education can be studied under the following phases:

Phase I (1948-85)

Post-independence, national leaders, notably Nehru, recognised the urgency for reform. Nehru made certain remarks about the new education system meeting the national goals of an independent India (e.g., democracy, secularism, national integration, etc.) at an educational conference, highlighted the imperative to revolutionise the entire higher education system in India (Choudhary, 2008a; Naik, 1965). In response, the Government of India established the University Commission in 1948, chaired by Dr Sarvepalli Radhakrishnan. Tasked with meeting the demand for a skilled workforce for national socio-economic growth, the Commission focused on higher education restoration. The recommendations encompassed various aspects, including the 10+2 pre-university structure, reducing excessive specialisation, promoting research, and introducing professional education in areas like agriculture, commerce, law, medicine, education, science, and technology (Ghosh, 1995a). The Commission proposed altering the examination system by continuous assessment, offering courses on key religious philosophy issues, and restructuring universities as autonomous entities. It also suggested creating the University Grant Commission (UGC) for grant allocation and placing university education in the Concurrent List (Ghosh, 1995b). Several recommendations were implemented, including establishing the UGC in 1953 and expanding women's education across all levels. In 1950–51, only 43 women were enrolled in university

courses, but by 1976–77, they constituted about 26 per cent of all higher education students (Choudhary, 2008b).

The Radhakrishnan Commission,⁴ though making significant suggestions, was perceived as unsuccessful in addressing illiteracy eradication in India. Emphasising the crucial role of education in achieving rapid economic growth, technical advancement, and socially just order, the third five-year plan highlighted the need for a national educational system (Choudhary, 2008c). In 1964, the Education Commission, led by Dr D. S. Kothari, was established to provide broad principles for enhancing education at all levels. The Commission called for internal transformation, qualitative improvement, and quantitative expansion of educational facilities (Gol, 1966; Choudhary, 2008d). Projecting 170 million students by 1985, it proposed increased educational spending and equalisation of opportunities. The recommendations led to adopting the first National Policy on Education in July 1968, which became the foundation for subsequent governmental actions (Ghosh, 1995c).

It should again be noted that in 1974, the "Report of the Committee on the Status of Women in India", also known as the "Towards Equality Report", was a landmark document that addressed issues of gender inequality and discrimination against women in various spheres, including education. Chaired by Phulrenu Guha, the committee made several recommendations to improve women's access to education and ensure equality of opportunity. It called for expanding educational facilities for girls, especially in rural and backward areas, and providing incentives like free education, scholarships, and hostel facilities to promote girls' enrolment. The report emphasized the need to remove gender bias and stereotyping in curriculum, textbooks and teacher training and encouraged women's participation in non-traditional fields of study like science,

⁴ The 1948–1949 "University Education Commission", also referred to as the "Radhakrishnan Commission" was a post-independence Indian government commission that assessed the quality of university education; with the

primary goal to establish a well-coordinated system of higher education that would yield people qualified to serve as intellectual leaders for the newly formed nation (MoEC, Gol, 2020).

technology, and vocational education. It also recommended the appointment of more women teachers to serve as role models. The report highlighted the critical role of education in empowering women and achieving gender equality in India (MoESW, GoI, 2020). Despite attempts to alter the Kothari Commission's recommendations, the new education policy took effect in May 1986 (Ghosh, 2000a).

Phase II (1986-2021)

The 1986 National Policy on Education aimed not only to educate citizens for economic purposes but also to instil critical values. It focused on Education for Development and Education for Equality. The Acharya Ramamurthi Committee evaluated the policy and proposed strategies in its 1990 report, *Towards an Enlightened and Humane Society*.⁵ The recommendations included establishing autonomous colleges, forming State Councils of Higher Education, evolving teaching strategies, creating a National Council of Higher Education, democratising higher education through open universities, and establishing rural universities. The 1992 Program of Action outlined specific steps to implement these ideas (MHRD, 1992). Privatisation entered the higher education system after the 1991 Economic Policy Reforms. Government budget cuts for higher education began in 1990, and by 1995, the UGC was advised to develop guidelines for private universities, though no bill was introduced in the Parliament (Ghosh, 2000b).

In 2005, led by Sam Pitroda, the National Knowledge Commission (NKC) was established to bolster institutional growth in education, research, and capacity building. The 2007 NKC report aimed at revitalising Indian education for the 21st century, focusing on five key areas: enhancing knowledge access, promoting expertise, positioning India as a global knowledge leader, fostering inclusive growth through knowledge, and optimising service

delivery through knowledge application. The NKC recommended ambitious goals, including the establishment of 1,500 universities, with 50 national universities offering high-quality education by 2015. It proposed the creation of an Independent Regulatory Authority for Higher Education to streamline functions such as admission, accreditation, fund allocation, positive action, and licensing (GOI, 2009a). The 11th five-year plan, influenced by the NKC, implemented these proposals, emphasising structural adjustments, relevance-based funding, and increasing education spending to 6 per cent of the GDP. The plan also aimed to establish 30 central, 16 state, and 14 world-class institutions (Power, 2012b).

In 2009, the Yash Pal Committee released a report titled *Committee to Advise on the Renovation and Rejuvenation of Higher Education*, addressing the evolving landscape of higher education in India. Formed to reassess the current structure of regulatory bodies, the committee aimed to suggest changes for global competitiveness. Viewing universities as innovation hubs, the group recommended establishing independent entities to foster creative ideas and channel knowledge in a constructive direction. The Yash Pal panel advocated reforming and revitalising the college system to enhance university performance, especially in public institutions (Pal, 2009).

Under the leadership of Krishnaswamy Kasturirangan, the Government of India crafted a National Policy on Education in 2020 intending to bridge the gap between the current higher education system and the demands of the 21st Century. Recognised as the inaugural education policy of the 21st Century, it seeks to address numerous developmental challenges in the country. The policy proposes a comprehensive overhaul of all aspects of the educational framework, encompassing legislation and

⁵ The 1990 report, *Towards an Enlightened and Humane Society*, also known as the *Acharya Ramamurti Report*, reviewed the *National Policy on Education*, 1986. It critiqued the existing education system for prioritising rote memorisation and neglecting creativity, social justice, and work skills. The report also advocated for educational

reforms promoting equity, decentralisation and values that cultivate a humane and enlightened society (Committee for Review of National Policy on Education, 1990).

governance, to establish a new system aligned with the ambitious goals of 21st Century education, particularly Sustainable Development Goal-4 (SDG-4). This goal is to prioritise inclusive and fair access to high-quality education and advocate for continual learning opportunities for everyone while also leveraging India's abundant traditions and values. The Committee advocated for creating a unified body to enhance coordination among higher education institutions. To expand access to higher education in India, the committee recommended the implementation of a flexible entry and exit program through the introduction of an *Academic Bank of Credits*,⁶ technology-based options for adult learning, the availability of e-courses in regional languages, and the establishment of foreign universities (Gol, 2021).

Government Funding in Higher Education in India

India's higher education sector stands at a pivotal juncture, characterised by unprecedented growth and persistent challenges. At the heart of this crossroads lies the crucial role of government funding — a force capable of propelling or hindering the nation's aspirations for accessible, equitable, and quality education. The funding framework within the Indian higher education domain has traditionally relied heavily upon government allocation, bearing the lion's share of associated expenses. The primary channels of government funding are navigating a complex interplay of direct grants, block grants, and schemes tailored for specific purposes (Deb, 2023a). Nonetheless, apprehensions linger regarding the sustainability of this Higher Education funding framework model, particularly amidst escalating demands for advanced education and strains on public finances (Sharma, 2022).

Government funding for higher education in India has exhibited a consistent upward trend over the past few years. The National Education Policy (NEP) 2020 envisions raising public expenditure on education to 6 per cent of GDP.

However, the current expenditure remains at a stark 2.9 per cent. While the higher education budget for 2023-24 saw a modest increase of 8 per cent over the previous year, concerns remain about its adequacy considering the growing student population and the need for infrastructure development (Gol, 2023; Rao, 2023). This uneven distribution of government funding has exacerbated disparities in infrastructure, faculty resources, and research facilities across higher education institutions (Deb, 2023b). This has resulted in varying levels of access to quality education, with institutions receiving substantial support often outperforming those struggling with limited resources (Varghese, 2021a). These disparities have created a two-tiered system within the higher education sector, raising concerns about equity and social mobility. The current government funding mechanisms in the Indian higher education sector face several challenges, including inefficient allocation, lack of transparency, and an inadequate funding formula. The opaque nature of resource distribution has raised concerns about waste and mismanagement. At the same time, the UGC's funding formula has been criticised for failing to reflect the diverse needs and performance of different institutions adequately. Concerns about the traditional 'block grant' approach have been raised, where predetermined budgets are allocated without considering factors like student enrolment, research output, or institutional. This raises questions about the effectiveness and fairness of funding distribution (Tobenkin, 2022).

The government's inadequacy in meeting escalating educational demands has thus propelled the involvement of the private sector in higher education through public-private partnerships (Sharma, 2015). Their retreat from pivotal sectors, including education, has further affected funding for state and central universities in India (Krishnan, 2021a). While the government extends grants to various

⁶ The National Education Policy 2020 suggested creating an *Academic Bank of Credit* that digitally stores academic credits obtained by students from different accredited

universities. This would enable flexible program entry, exit, and smooth system mobility throughout higher education (MHRD, 2020).

educational institutions, the onus of financing higher education has shifted to the private sector, particularly those with limited incomes (Garg et al., 2020). This transition has raised concerns regarding the affordability and accessibility of quality education nationwide. To mitigate these challenges, universities must explore alternative resource mobilisation channels and diminish reliance on state grants (Duraisamy & Duraisamy, 2016).

Despite these challenges, opportunities exist to enhance government funding for higher education in India. Performance-based funding mechanisms could incentivise institutions to improve their teaching and research quality, with funding allocations linked to measurable outcomes such as student learning outcomes and research productivity (Panigrahi, 2023). However, ensuring effective communication and coordination for optimal resource utilisation remains a challenge. The lack of adequate student loans and scholarships also amplifies equity concerns, hindering access for students from disadvantaged backgrounds. In this regard, endeavours have been made to probe alternative financial avenues encompassing public patronage, student loans, graduated levies, student tuition, and collaboration with the private sector (Behera & Khatej, 2018). A discerning pricing structure has been suggested as the most effective and impartial approach (Krishnan, 2021b). Concurrently, a shift has occurred towards emphasising primary education funding over secondary, tertiary, and technical education. This pivot highlights the necessity to bolster investment within India's higher education sector and explore diverse funding methodologies, ensuring the enduring sustainability of advanced learning (Abdullah et

al., 2017). In the next section, we discuss the sources of our data and the methodological approach.

Methodology

The paper employs a secondary research approach, relying solely on examining existing data gathered from reputable sources such as All India Survey on Higher Education (AISHE) reports, Selected Educational Statistics, UGC publications, Reserve Bank of India (RBI) reports, government records, and other reliable databases. Additionally, these reports are used to extract relevant information regarding metrics related to higher education accessibility, including GER and dropout rates.

STATA is used to conduct rigorous analysis and model fitting. Figure 1 illustrates the performance of the variables, namely GER and government expenditure (at 2011-12 constant prices), over time. Due to the nonlinearity observed in the performance of dependent variables over time, a linear regression represented by a straight line is found to be inappropriate for expressing their growth and making predictions. The Gompertz model has been identified as the most appropriate non-linear regression model for conducting time-series analysis. It has been employed to calculate the growth rates of various variables, illustrating a sigmoid curve over the past three decades (1990-91 to 2020-21). Thus, the model's capacity to mirror such patterns makes it an appropriate choice for predicting growth rates of various variables, including GER and government funding, extending until 2035. The Gompertz equation applied in this study can be articulated as follows:

$$y = b_0 + b_1 * \exp(-\exp(-b_2 * (t - b_3)))$$

where b_1 is the upper asymptote, b_2 is the relative growth rate, b_3 represents the point of inflection and t is the time period. Further, the actual growth rate is calculated by multiplying b_1 with b_2 and then dividing it by the base of the natural logarithm (Tjørve & Tjørve, 2017)

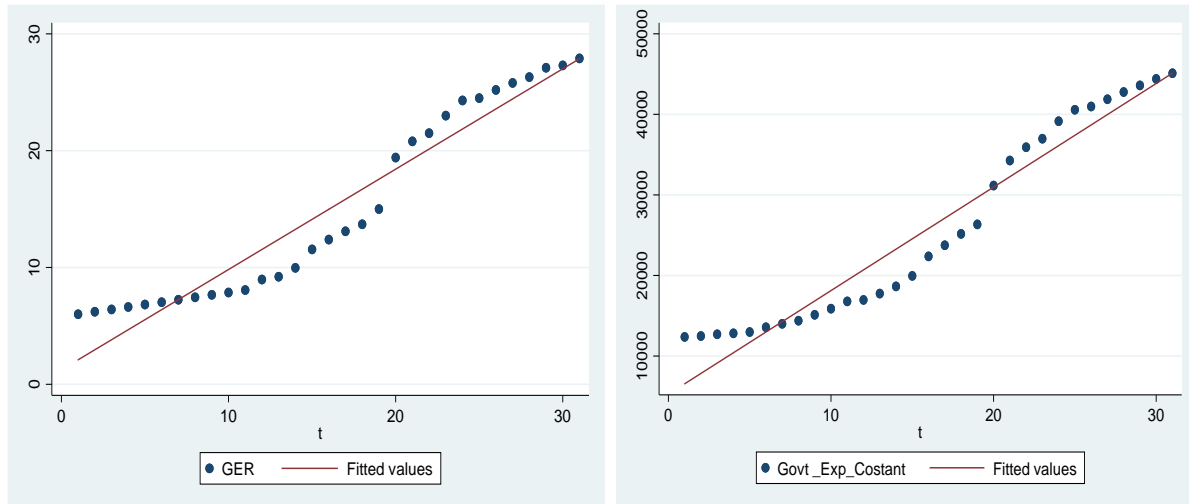


Figure 1: Scatter Diagram Depicting the Relationship of GER and Government Expenditure with Time

Source: Authors’ Computation Compiled (year-wise) from Selected Educational Statistics and AISHE Reports of MHRD and Educational Budgets (year-wise) of the Government of India

Moreover, the current research incorporates a multiple linear regression model with GER as the dependent variable. GER is deemed to be the pivotal parameter for assessing the growth of higher education in India, and its correlation

with state-wise characteristics is examined to understand variations in higher education GER. The conceptual model can be articulated in the following functional format:

$$GER = f(X)$$

The GER in higher education in India is analysed using a regression model, where X represents the set of independent variables influencing GER. The goal is to identify the independent variable with the most significant impact on GER.

While Total Enrollment is a crucial factor in this analysis, it needs to be excluded due to multicollinearity issues.⁷ Therefore, the regression equation employed in this study is as follows:

$$GER = \alpha + \beta_1 (TNHEIs) + \beta_2 (TTA) + \beta_3 (GExp)$$

Where GER = Gross Enrolment Ratio

TNHEIs = Total Number of Higher Educational Institutions

TTA = Total Teachers Appointed

GExp = Government Expenditure

⁷ Initially, a problem emerged with the structured linear regression model when "Total Enrolment" was included as an independent variable. The variance inflating factor exceeded 10, indicating multicollinearity within the model. Multicollinearity can cause issues like inflated standard

errors and unreliable coefficient estimates and create trouble in interpreting the distinct effects of the independent variables on the dependent variable (Gujarati & Porter, 2004). Therefore, the variable in question has been excluded from further analysis as a corrective step.

Results and Discussion

Growth of Higher Education in India

The growth of higher education in India has been assessed through various metrics such as the total number of higher educational institutions, total enrollment, GER, and the Student-Teacher Ratio (STR). At the time of independence in 1947, India had only 25 universities and 496 colleges. However, by 2005, these numbers had expanded significantly to 348 universities and 17,625 colleges. This expansion is further

evident in the surge of enrolled students, which rose from 0.1 million in 1947 to 10.48 million in 2005 (Prakash, 2007c). The current study specifically examines the evolution of the Indian higher education system from the year 1950-51 to 2020-21. In analysing this growth, pertinent literature considers the total number of institutions offering higher education (including both universities and colleges), the overall enrollment of students, and the total number of appointed teachers (Ravi et al., 2019a; Sharma, 2020).

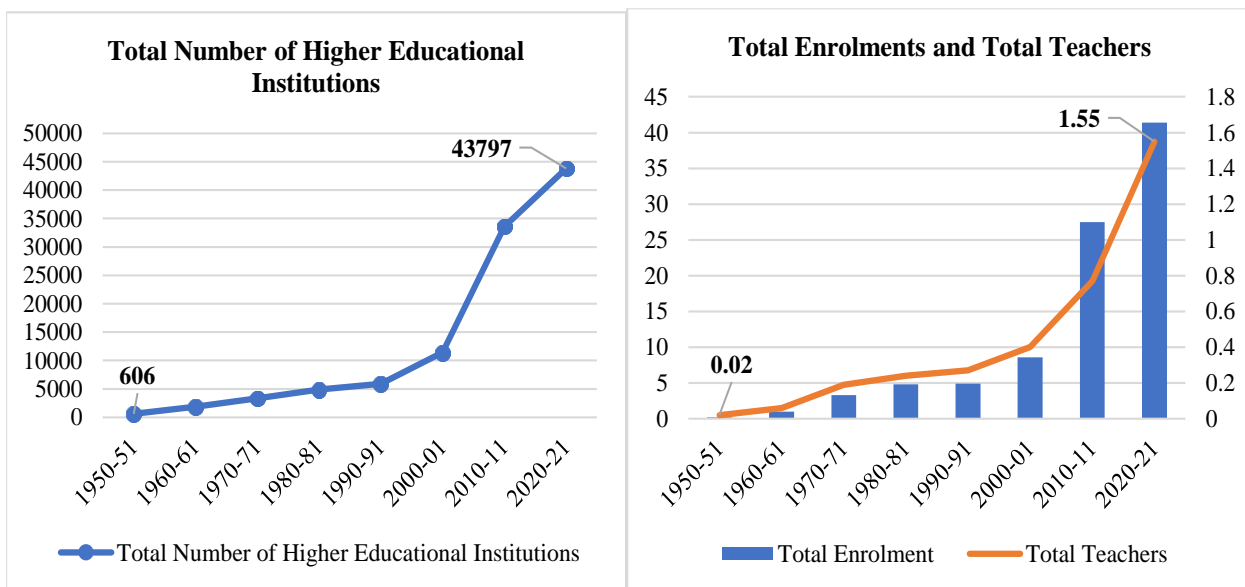


Figure 2: Decadal Growth Trend of Higher Education in India
 Source: Prakash (2007); Compiled (year-wise) from AISHE Reports, MHRD

As depicted in Figure 2, the total number of higher educational institutions has experienced a notable surge, with a CAGR of 6.31 per cent, escalating from a modest 606 institutions in 1950-51 to an impressive 43,797 in 2020-21. This upward trajectory signifies the swift expansion of the higher education landscape in India.

Furthermore, both total enrolments and the enrolment of teachers in higher educational institutions during the aforementioned period

have witnessed substantial increases. While the total enrolment has exhibited a CAGR of 7.93 per cent, escalating from a mere 0.2 million in 1950-51 to a remarkable 41.88 million in 2020-21, the total faculty enrolment has seen a growth at a CAGR of 6.41 per cent, ascending from approximately 0.02 million to 1.55 million over the same timeframe. The growth of higher education in India has been further analysed with special reference to the post-reform period, as represented with the help of Table 1.

Table 1: Growth of Higher Education in India during 1990-91 to 2020-21					
Year	Total Number of Higher Educational Institutions*			Total Enrolment** (in million)	Total Teachers (in million)
	Universities	Colleges	Total		
1990-91	184	5748	5932	4.09	0.27
2000-01	244	9906	10150	7.73	0.35
2010-11	511	29787	30298	23.05	0.65
2011-12	642	34852	35494	29.18	1.25
2012-13	667	35525	36192	30.15	1.31
2013-14	723	36634	37357	32.34	1.37
2014-15	760	38498	39258	34.21	1.47
2015-16	799	39071	39870	34.58	1.52
2016-17	864	40026	40890	35.71	1.37
2017-18	903	39050	39953	36.64	1.28
2018-19	993	39931	40924	37.40	1.42
2019-20	1043	42343	43386	38.54	1.5
2020-21	1113	43797	44910	41.38	1.55
Growth Rate #	6.55	8.00	8.03	9.20	7.14

Table 1: Growth of Higher Education in India during 1990-91 to 2020-21

Source: Compiled (year-wise) from Selected Educational Statistics and AISHE Reports of MHRD

Note: # Growth rates are computed by fitting the Semi-log model

* Universities include central, state, deemed and private universities and institutes of national importance, and colleges include both government and private colleges (aided and unaided ones).

** Total enrolment includes enrolment in Ph.D., M.Phil., Post-Graduate, Under-Graduate, Post Graduate Diploma, Diploma, Certificate, and Integrated Courses.

It is apparent from Table 1 that the evolving landscape of higher education in India has undergone a significant transformation with the proliferation of universities and colleges, particularly in the post-reform era. Over the past three decades, the count of universities escalated from 184 in 1990-91 to 1,113 in 2020-21, exhibiting a Compound Annual Growth Rate (CAGR) of 6.55 per cent. Concurrently, the number of colleges surged from 5,748 in 1990-91 to 43,797 in 2020-21, registering a CAGR of 8 per cent. The apex of educational institutions was reached in 2020-21, albeit 78.6 per cent of these belong to the private sector, encompassing aided and unaided colleges (MHRD, 2021a). Likewise, there has been a

substantial increase in total enrolment and the number of appointed teachers, with CAGRs of 9.20 per cent and 7.14 per cent, respectively, during the specified period. It is crucial to emphasise that the private sector has propelled a significant portion of the growth, particularly in recent years. While institutions relying on public funding experienced almost no growth, those supported by private financing saw a rapid surge. This highlights the influential role played by private investment in driving the expansion of higher education institutions during this period. Figure 3 illustrates the annual growth trend of both public and private higher educational institutions from 2011-12 to 2020-21.

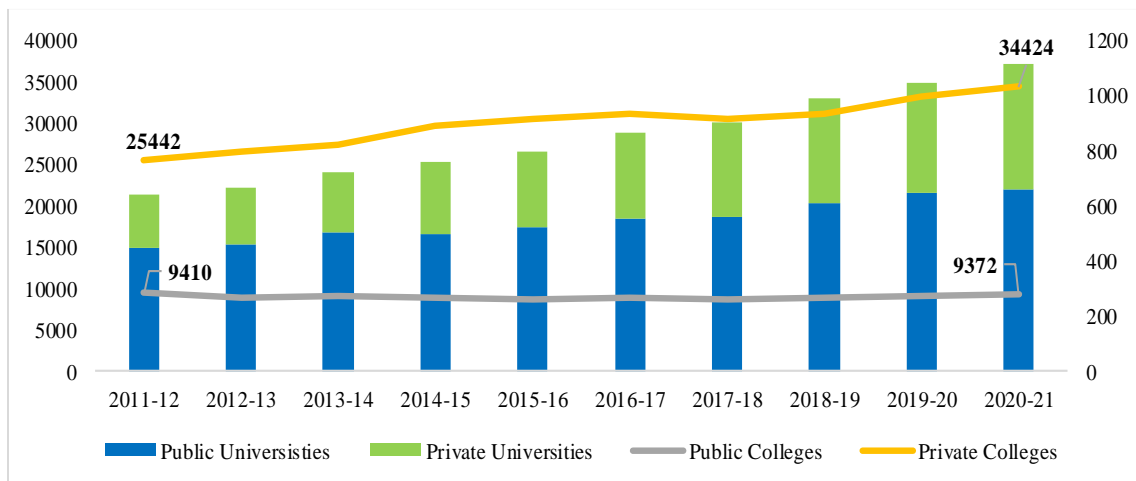


Figure 3: Annual Growth Trend of Public and Private Higher Educational Institutions, 2011-2012 to 2020-2021.

Source: Compiled (year-wise) from AISHE Reports, MHRD

Further, considering the state-wise distribution of public and private universities and colleges, it is found that Andhra Pradesh boasts the highest number of public universities among states, with 58, followed closely by Uttar Pradesh with 48 and West Bengal with 40 as of 2020-21. In contrast, the North-Eastern states (excluding Assam), Goa, and Himachal Pradesh each have fewer than 15 public universities. Rajasthan leads in private universities with 59, followed by Gujarat with 46 and Madhya Pradesh with 39. Chandigarh and Jammu & Kashmir have no private universities. The distribution of public and private colleges follows a similar trend, with Uttar Pradesh, Madhya Pradesh, and Rajasthan having the highest count of public colleges. At the same time, Uttar Pradesh, Maharashtra, and Karnataka lead in private colleges. Except for Assam, the other North-Eastern states have fewer than 100 colleges, both public and private,

as of 2020-21. Figure 4 is a visual representation of the state-wise distribution of institutions.

The number of educational institutions has grown significantly, accompanied by a substantial increase in enrollments since 1990-91. Over seven decades, from 1950-51 to 2020-21, enrollments have risen remarkably from 0.4 million to 41.38 million, reflecting an impressive increase of about 41.34 million during this period. Several factors contributed to this surge in enrollments, including a notable 15 per cent increase in transition rates from secondary to higher education, rising from 58.1 per cent to 73.3 per cent between 2008-09 and 2020-21, as reported by the Ministry of Education in 2020 (Tilak & Biswal, 2015; MoE, 2020). The growing aspirations of individuals to contribute to the nation’s growth and the belief that higher education enhances social status have also played a role in driving this trend.

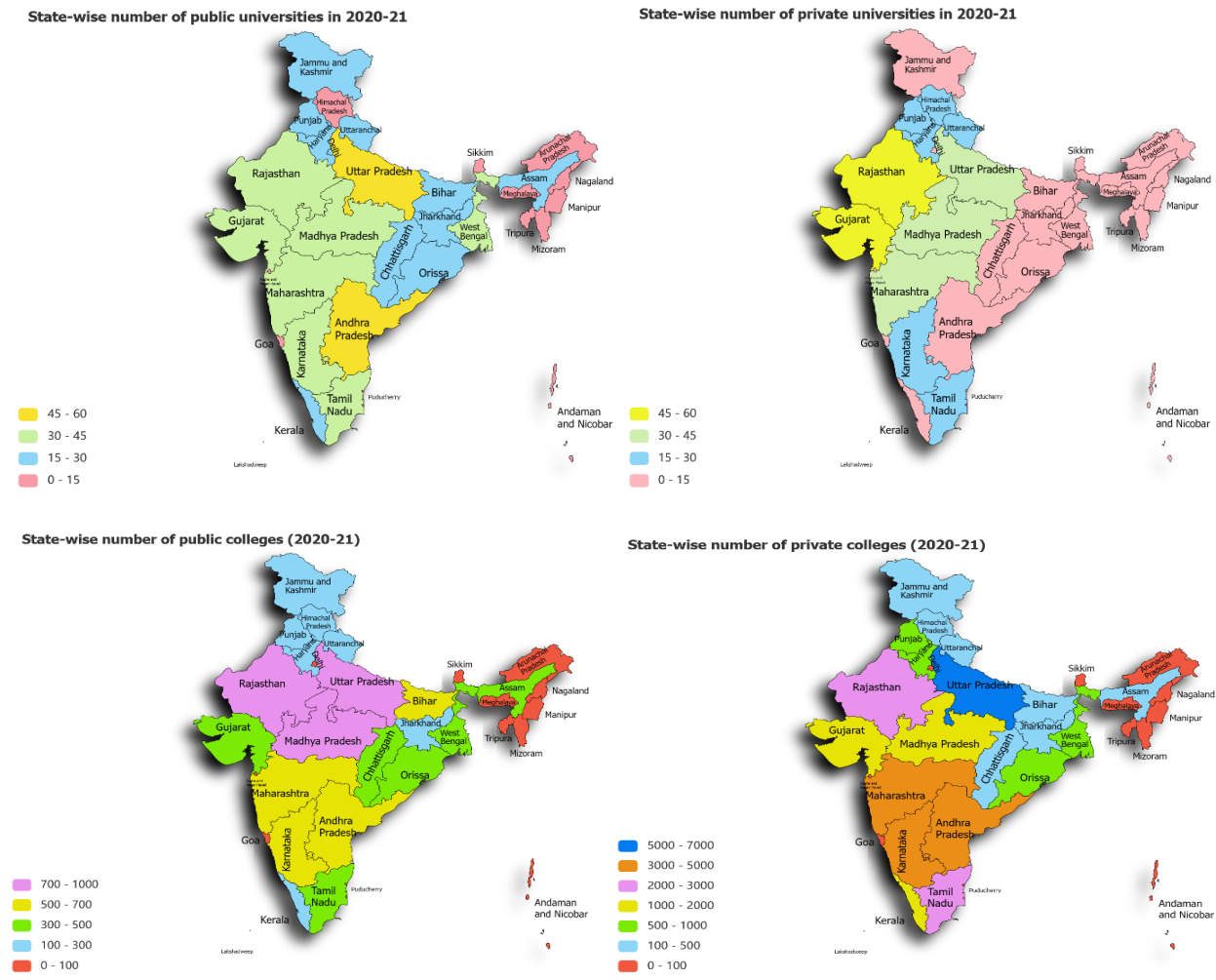


Figure 4: State-wise Distribution of Public and Private Institutions in 2020-21
 Source: AISHE Report 2020-2021

Access to Higher Education in India

‘Access’ to Higher Education represents the phase where students can enroll in a program and pay the enrollment fee. It goes beyond individual needs, influenced by objective factors like government policies, economic conditions, and race/gender structures, as well as subjective factors such as personal effort in school or family support (Walker, 2019). Existing literature highlights unequal access to education in various strata of Indian society, particularly in higher education. The primary challenge is the insufficient number of higher education institutions compared to the overall population in that age group, intensifying the issue of

inaccessibility. In India, metrics like GER and the number of colleges per hundred thousand population are commonly used to gauge access to higher education (Choudhary, 2008e; Powar, 2002b; Prakash, 2007d; Varghese, 2015b). GER is the ratio of enrolled students to the total population, expressed as a percentage (UNESCO, 2009b). Colleges per hundred thousand population indicate the total number of available colleges for every hundred thousand eligible individuals aged 18-23 years (MHRD, 2021b).

The surge in students transitioning from secondary to tertiary education, along with increased financial incentives for graduates in the private sector, has significantly contributed

to the upward trend in India's Gross Enrollment Ratio (GER). From 1970-71 to 2020-21, GER has risen remarkably by over 20 per cent, going from 4.9 per cent to an impressive 27.3 per cent. This indicates India's transition into the massification stage, where higher education becomes a right for those with the appropriate qualifications

(Ravi et al., 2019b). The halfway achievement of 27.3 per cent in 2020-21 not only reflects the nation's commitment to expanding higher education accessibility but also highlights the diverse impacts of policy changes and evolving socio-economic dynamics on educational attainment (Gol, 2009b).

Table 2: Gross Enrolment Ratio in India during 1990-91 to 2020-21	
Year	Gross Enrolment Ratio (in percentage)
1990-91	6.00
2000-01	7.86
2010-11	19.41
2011-12	20.8
2012-13	21.5
2013-14	23.0
2014-15	24.3
2015-16	24.5
2016-17	25.2
2017-18	25.8
2018-19	26.3
2019-20	27.1
2020-21	27.3
Growth Rate #	1.19

Source: Compiled (year-wise) from Selected Educational Statistics and AISHE Reports of MHRD
Note: # Growth rate is computed by fitting the Gompertz equation

Table 2 displays the GER in higher education across India from 1990-91 to 2020-21, accompanied by the growth rate derived from fitting the Gompertz equation. Starting at a modest 6 per cent in 1990-91, the GER underwent a gradual escalation, surpassing the 20 per cent threshold in 2011-12 and finally attaining 27.3 per cent by 2020-21, signifying a substantial fourfold increase from its 1990-91 baseline. The swiftly growing higher education landscape often obscures significant disparities in accessing this sector. Despite a continuous rise in GER over time, the proportional increase in the number of institutions per hundred thousand population has not kept pace. According to statistics published by the Government of India, the count of institutions per hundred thousand population in India only saw a modest increase from 25 to 31 between the academic years 2011-12 and 2020-21.

This rapid expansion of higher education in India masks a significant disparity in accessibility among states and union territories. The distribution of higher educational institutions highlights an apparent inequality, with Lakshadweep lacking any such institutions, indicating a bleak educational landscape. On the contrary, 17 states and union territories have exceeded the national average of 31 institutions per hundred thousand population in the 18-23 age group as of 2020-21. Karnataka (62), Telangana (53), Kerala (50), Himachal Pradesh (50), and Andhra Pradesh (49) lead in the number of institutions per hundred thousand population, showcasing robust infrastructure and educational access. Southern states like Tamil Nadu and Kerala, known for their historical emphasis on education, exhibit higher demand and a better student-to-institution ratio. Conversely, Bihar (8), Delhi (8), and Jharkhand (9) present a worrisome scenario with fewer

than 10 institutions per hundred thousand population, highlighting challenges in educational accessibility. This disparity underscores the need for targeted interventions and policies to ensure a more balanced and equitable distribution of educational opportunities across states and territories.

Gaining access to Higher Education involves more than just enrolling in a higher educational institution; it also encompasses successfully completing the corresponding course of study and obtaining a degree (HEA, 2008; Prodan et al., 2015). It also refers to the ways in which Higher Education institutions, their governance, and higher educational policies ensure or aspire to ensure that all potential students have equal and equitable opportunities to gain access to higher education institutions and allow these students to take full advantage of their educational opportunities (Kohtamäki & Kaila, 2021). Therefore, beyond examining overall enrollment figures, it is crucial to consider the substantial number of students who do not complete their studies when analysing real access to higher education. Recognising the importance of dropouts in assessing access to higher education, this study introduces the Dropout-Enrollment Ratio (DER) as a key metrics. DER provides insights into the challenges faced by the students in completing their education and the effectiveness of the system in retaining students to complete their education. It shows how well the education system helps students complete their education effectively. Hence, a high DER may demonstrate challenges like poor academic support to students, lack of financial assistance, poor quality in primary and secondary education, poor quality of teaching and learning, or lack of proper career guidance and so on. DER also sheds light on the long-term results of higher education, such as employability and career options.

Both enrollment and Gross Enrollment Ratio (GER) in India's higher education system have seen significant growth. However, the completion rate remains low, with only 23.06

per cent of students successfully completing their programs in the 2020-21 academic year, highlighting a substantial dropout rate of 76.94 per cent. The GER of India's higher education system shows that it has achieved the early stage of massification, but a closer look at the DER reveals a different reality, indicating that a higher proportion of enrolled students leave their education incomplete. Various socio-economic factors impact student retention, including subpar teaching quality, financial constraints, inadequate student support services, poor infrastructure, traditional teaching methods, and a lack of collaboration between academia and industry (Malik, 1984). Financial issues, particularly high fees in government institutions, significantly affect retention, with students from economically disadvantaged backgrounds facing the highest impact (Rout, 2015a). The expense for completing both undergraduate and postgraduate studies at a government college ranges from Rs. 5 to Rs. 6 lakhs (Jain, 2022a). Most students in government institutions come from households with monthly per capita expenditures below INR 3860 in rural and INR 6521 in urban areas (MoSPI, 2024). In rural areas, general education costs INR 5240 on average, while in urban areas, it is INR 16308, over three times higher. Additionally, annual average fees for management, engineering, and medicine programs are INR 58555, INR 63280, and INR 71620, respectively (Jain, 2022b). Besides financial constraints, factors like a rigid curriculum, test patterns, and limited interactions with teachers and peers contribute to the higher dropout and lower completion rates in India's higher education. Consequently, the government is tasked with providing quality, subsidised education to the economically disadvantaged and ensuring their retention (Rout, 2015b). In this regard, the implementation of various scholarships aimed at alleviating the burden of high tuition fees in the higher education sector emerges as a viable strategy. Initiatives such as the *Pradhan Mantri Uchchatar Shiksha Protsahan (PM-USP)*⁸

⁸ PM-USP is a scholarship scheme launched in 2021 to provide financial assistance to students from economically

weaker sections to pursue higher education, promoting equity and inclusion by supporting meritorious students

scholarship scheme, along with the "Ishan Uday"⁹ special scholarship scheme tailored for students from North-Eastern regions pursuing higher education in government institutions, were introduced by the Government of India to offer financial support to individuals from economically disadvantaged backgrounds pursuing advanced studies. Additionally, the University Grants Commission (UGC) has mandated that all higher education institutions set aside 10 per cent of seats for students belonging to Economically Weaker Sections (EWS) and provide them with fee waivers or subsidies. These measures collectively hold the potential to enhance retention rates over the long term.

In the given context, the National Education Policy 2020 is portrayed as a highly praised initiative aimed at advancing the higher education sector in India. The document outlines the Government of India's ambitious target of achieving a 50 per cent Gross Enrollment Ratio (GER) in higher education by 2035, marking the final phase of massification (GoI, 2021b). However, even after accounting for model limitations, despite its impressive growth, the ongoing enrolment rate might not be sufficient to reach this target within the set timeframe. Consequently, this study utilised the Gompertz model to forecast GER and determined that the projected figure would only reach 30 per cent. This indicates that India is unlikely to achieve its 2035 target with the current policy initiatives. Potential reasons for the inability to reach the desired goal by 2035 may include a shortage of higher educational institutions, insufficient government expenditure in higher education, and an inadequate number of teachers in proportion to total enrollment in higher education.

The current study sought to create a multiple linear regression model to evaluate the

significance of various factors affecting GER in Higher Education in India. The analysis involved regressing GER values from 1991 onwards against the total number of higher educational institutions overall, the count of appointed teachers, and the total government expenditure in higher education spanning the period from 1990-91 to 2020-21, expressed in 2011-12 prices. The resulting estimates from the specified model can be summarised in Table 3.

The regression analysis results, as presented in Table 3, demonstrate that GExp is highly significant at a 5 per cent significance level, exhibiting a positive relationship. On the other hand, TNHEIs and TTA are deemed statistically insignificant. The model boasts a relatively high R^2 value of 0.7010. These findings suggest that fluctuations in government expenditure on higher education in India significantly impact the growth of the GER. The study reveals that for every thousand-unit increase in government spending on higher education, there is a corresponding rise of approximately 1.7 units in GER. Extrapolating this, a one-million-unit increase in government expenditure would increase GER by around 1700 units. Considering the current growth rate, the study attempts to forecast future values of GER and government expenditure in higher education until 2035, aligning with the targets outlined by the NEP 2020 committee.

Figure 5 illustrates the goodness of fit of the Gompertz model using GER and government expenditure data during the time period 1990-91 to 2035-36. It displays well-fitted observed and fitted S-curves of Gompertz model related to GER and government expenditure that capture a positive trend between the variables over time. Based on this, the projected values are summarised in Table 4 below.

who face financial constraints (National Scholarship Portal, 2022).

⁹ *Ishan Uday* scholarship scheme, specifically designed to offer financial support to students hailing from the North Eastern Region of India to pursue higher education, was

introduced by UGC in 2014-15. It extends scholarships to economically disadvantaged students from the North-East Region, enabling them to pursue various educational paths, including general, technical and professional degree programs (UGC, 2015).

Table 3: Results of Regression Analysis for Explaining Factors Affecting GER of India's Higher Education			
Variables	Estimated Coefficients	t-values	Level of Significance
TNHEIs	- 0.00005	- 0.45	0.656
TTA	- 1.07412	- 1.14	0.265
GExp	0.00075	5.59	0.000*
Constant	0.01624	0.12	0.909
R ²	0.7010		
F (v1=3, v2=25)	19.54		0.000*

Note: * indicates significance at 0.05 level
Source: The authors calculated this information by utilising data from AISHE Reports and Demand for Grants Reports of Higher Education

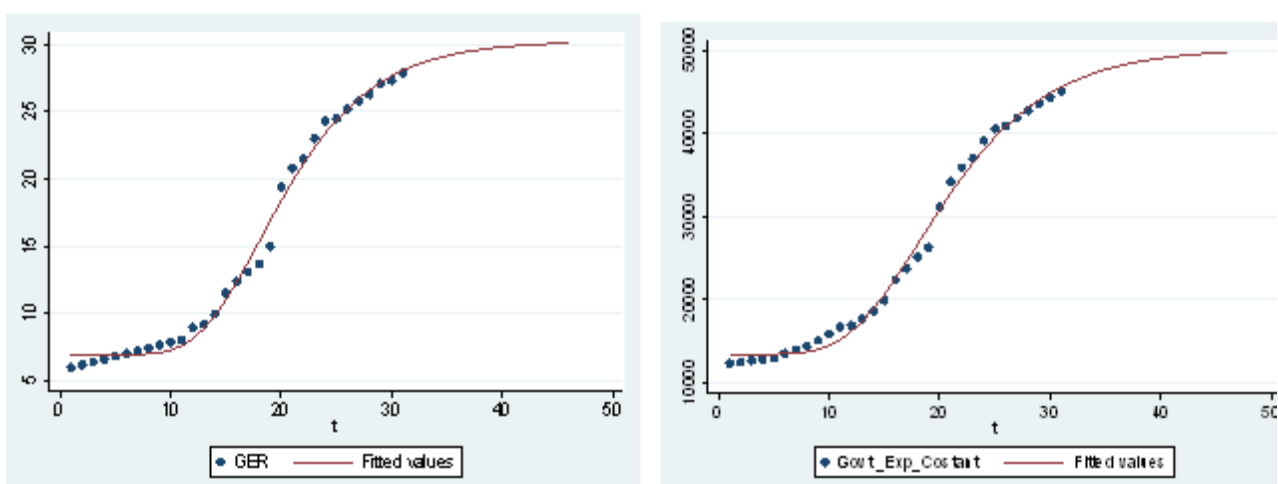


Figure 5: Observed and Fitted Gompertz Curves Over Time

Source: Author's Computation Compiled From (year-wise) Selected Educational Statistics and AISHE Reports of MHRD and Educational Budgets (year-wise) of Government of India

Table 4: Predicted Values of GER and Government Expenditure in Higher Education in India		
Year	Government Expenditure*	GER*
2025-26	48062.6	29.34
2030-31	49248.48	29.88
2035-36	49806.87	30.10

Note: * Authors' Computation using Gompertz equation

Based on the projections of the Gompertz model, Table 4 indicates that if the present growth rate of 1.19 per cent remains consistent, the GER is expected to reach approximately 29.34 per cent in 2025-26 and approximately 30 per cent by 2035-36, with government expenditure reaching approximately INR 498068.7 million. Recognising the pivotal role of government expenditure in influencing GER, it can be argued that an increase in such spending is imperative for the government to meet its

2035 target. Consequently, it can be inferred that the role of government expenditure in higher education has not adequately contributed to expediting the process of increasing GER in India's higher education sector.

In this context, the ambitious target of NEP-2020 to attain a 50 per cent GER in the higher education sector by 2035 demands a substantial increase in government spending on the higher education sector. Projections based on the

current growth rate of 0.17 per cent in government spending in higher education combined with the 1 per cent mark for it as a share of GDP paint a sobering picture — GER is likely to languish around 30 per cent, far from the envisioned target. This stark reality necessitates revisiting funding strategies and exploring innovative approaches to bridge the resource gap. The policy's success hinges on recalibrating the approach towards higher education funding. Creative avenues such as public-private partnerships (PPPs), as suggested by NEP-2020, maybe a way forward in this regard. However, PPPs come with their own drawbacks, including the potential commercialisation of education aligned in favour of the elite section of society and reduced affordability for underprivileged students, which may hinder the attainment of universalisation in Indian higher education. Hence, by streamlining plutocracy and improving financial oversight, PPPs can be a useful initiative for attaining the universalisation of higher education. Further, alumni contributions and other philanthropic initiatives may also be of great help in raising funds for higher educational institutions in the near future. In addition to the need for a rise in the allocated budget share, there is also a need to advocate for targeted financial support programs such as scholarships and grants for economically disadvantaged students, enhanced infrastructure development, and investment in research and innovation. Supporting online learning initiatives, prioritising faculty development programs, incentivising industry-academia collaborations, and funding skill enhancement programs in higher education institutions are additional steps necessary for effective GER augmentation. Thus, meeting the benchmark of 1 per cent GDP allocation in the higher education sector is not only a prerequisite but surpassing the 6 per cent threshold in the entire education sector necessitates a considerable escalation in public spending within this domain to meet these demands.

Conclusion and Recommendation

In summation, the intricate interplay between growth, access, and government funding within

India's higher education landscape has propelled a dynamic evolution marked by expanding opportunities, heightened inclusivity, and a steadfast commitment to eradicating disparities. Given the massive growth required to meet the threshold level of GER as per the NEP-2020, it is equally important to realise the significance of DER, a crucial metric used to gauge access. While GER provides a broad measure of participation, DER offers valuable insights into the challenges faced by students and the education system's effectiveness. Encouragingly, the study's findings reveal a positive trend with a rise in higher educational institutions and GER, indicating progress in broadening educational access and fostering inclusivity. However, a persistent concern highlighted in the study is the marginal increase in overall dropout rates, signifying a need for further attention. To address issues related to DER, several European countries such as Austria, England, Finland, France, and Germany have implemented policies including additional funding for specific enrolled students, increased student financial support budgets, funding for students in general, enhanced teaching funds, and institutional rewards for quality and academic success. Similarly, the United States has employed initiatives like Pell Grants and the Federal Work-Study (FWS) Program to assist undergraduates from low-income backgrounds with financial aid and part-time job opportunities. Similar efforts might be undertaken by the Government to reduce DER in India by increasing its funding in the higher education sector.

In this context, the Kothari Commission in 1964 recommended that government expenditure on education should be 6 per cent of GNP by 1986. Although the proportion of GNP spent on education doubled from 1.8 per cent in 1965-66 to 3.5 per cent in 1985-86, but flattened to 3.4 per cent in 1986-87, yet India fell short of achieving its required target of government expenditure in the 1990s decade.

Later revisited by the Central Advisory Board of Education (CABE) in 2006, it recommended that government expenditure on education should be 6 per cent of the total GDP, out of which 1 per

cent should be spent on higher education. Despite considerable strides, the trajectory of government expenditure on education has fallen short of the outlined targets, as evidenced by the disparities between recommended percentages and actual allocations. The aspiration to allocate 6 per cent of the GDP towards education has remained an elusive ideal. The efforts propelled the allocation in education to 4.3 per cent of GDP in 2020-21, out of which 1.6 per cent has been invested in higher education. The recent data for 2023-24, again, depicts a decline to 1.15 per cent in higher education funds. Even though the CABE's prescribed 1 per cent allotment for higher education has been met, it falls short of propelling the envisioned GER of 50 per cent by 2035, a cornerstone goal articulated in the NEP-2020. As depicted in our study, the attainment of GER will be around 30 per cent if the current growth rate continues, with the share of government expenditure in higher education out of total GDP going just above the 1 per cent mark.

The shortfall in reaching the recommended expenditure highlights a complex landscape where the estimations formulated decades ago by the Kothari Commission may no longer mirror the contemporary requisites. The education system's exigencies have evolved, demanding a re-evaluation of resource allocation. An emergent perspective suggests that the need of the hour transcends the erstwhile 6 per cent benchmark, as scholarly appraisals project a more substantial requirement, approximating 10 per cent of the GDP, to cater to the evolving educational landscape and research endeavours. Hence, it is evident that the stipulated 6 per cent of the GDP is no longer a ceiling but a floor for public expenditure in India's education domain. To effectuate meaningful strides and ensure an inclusive educational framework aligned with the aspirations of NEP-2020, an earnest re-evaluation and augmentation of financial allocations are imperative. The future trajectory demands a robust commitment, well beyond the erstwhile benchmarks, to foster a sustainable and progressive educational ecosystem that nurtures the aspirations and potentials of the nation's youth. NEP-2020, in this regard,

presents a bold and much-needed roadmap for Indian higher education even when the policy is fraught with challenges that call for effective implementation, unwavering commitment to equitable funding, and responsible resource management, through which the country unleashes its full potential and thereby transform its higher educational landscape.

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Ethical Approval

The imperative for institutional ethical approval is superfluous within the confines of this research manuscript, as the investigation exclusively hinges upon readily accessible data and does not involve any human participants.

Conflict of Interest

There is no potential conflict of interest to divulge, thereby safeguarding the research's integrity and lucidity.

Author Contribution Statement

The research manuscript is predicated upon the equitably distributed contributions of all three authors.

Informed Consent

As this research does not involve human participants or data collected through interviews, surveys, or direct interactions, no informed consent has been obtained from any individual.

Funding

This study did not receive financial backing from any organisation.

Data Availability Statement

The authors will make the data available upon request.

Acknowledgements

We thank the anonymous reviewers of *Space and Culture, India*, for their time and effort in evaluating the manuscript. We appreciate their valuable feedback and suggestions, which have enhanced its quality.