Elementary Education in India: Enrolment, Retention and Quality¹

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Submitted: 13.10.14; Accepted: 07.06.15

Abstract

It is now well recognized that enrolling children in schools is not enough; the instrumental role of education can be fully realized only if the education imparted in schools is of a desired quality. In recent years, many empirical studies have shown that although developing countries have made considerable progress in terms of enrolment, the same cannot be said about quality. In fact, there exists a complex interrelationship among enrolment, retention and quality. This paper tries to explore these interrelationships focusing on the elementary education sector in the fifteen major states of India. The learning environment in schools is analyzed by constructing composite indices for four dimensions – access, physical infrastructure, human infrastructure and learning time. The paper finds that states that have achieved high rates of enrolment have been successful in expanding school access, but have failed to ensure the necessary 'physical' and 'human' infrastructural facilities in those schools. Lack of proper learning environment adversely affects the learning outcomes of children. The quality of learning in India has been studied by constructing a Learning Achievement Index (LAI) for the primary grades. The paper finds that learning outcomes are poor even in states that are known to be relatively good performers in the field of social sector development.

Keywords: Elementary education, enrolment, learning environment, quality of learning

JEL classification: I21

1. Introduction

Universal elementary education (UEE) is not only a Millennium Development Goal (MDG) set by the United Nations, but also a fundamental requirement for the well-being of individuals. However, education can facilitate the achievement of different personal and social goals only when it is of a desired quality. According to UNESCO (2004), education comprises of a set of processes and outcomes that are *defined qualitatively*. At the international level, the emphasis on quality of education can be traced back to 1990 when the 'World Declaration on Education for All' recommended that education be made both

¹ I want to thank with extreme gratitude my Ph.D supervisor, Prof. Sarmila Banerjee, Rajiv Gandhi Chair Professor, Eco-systems and Sustainable Development, Coordinator (DRS in Economics), University of Calcutta, who not only motivated me into this research area but also gave important insights and valuable research guidance in developing this paper. Of course, all errors and shortcomings are entirely mine.

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universally available and improved qualitatively. In the year 2000, the 'Dakar Framework for Action' developed by UNESCO put forward quality of education as a fundamental determinant of enrolment, retention and achievement. The concept of 'quality education' has evolved over the years and it is now a multidimensional concept encompassing factors like learners' characteristics and their social environment, availability of enabling inputs (competent teachers, learning materials and school facilities) and learning outcomes of students (UNESCO, 2014).

Achieving UEE is a threefold challenge. The first one involves enrolling children in schools while the second is to make sure that they are retained in the school education system. The third one is to guarantee that children learn something meaningful while sitting in class. In recent years, many empirical studies have shown that although developing countries have made considerable progress in terms of enrolment, progress in terms of retention rates and learning outcomes are far less impressive (Filmer, Hasan and Pritchett, 2006; Das, Pandey and Zajonc, 2006; van der Gaag and Adams, 2010; Pritchett, Banerji and Kenny, 2013; van der Gaag and Putcha, 2013). In India also, it is observed that the net enrolment ratio (NER) has shown considerable improvement at the primary level and it was at par with the developed countries in the year 2007 (Planning Commission, 2011). However, the same cannot be said about quality resulting in poor learning levels, high repitition rates and gradual exclusion from school education (Kingdon, 2007; Kingdon and Banerji, 2009; Govinda and Bandyopadhyay, 2011; Bangay and Latham, 2013). In fact, there exists a complex interdependence among enrolment, retention and quality. On the one hand, poor quality education has a negative influence on family beliefs regarding the benefits of further investments in education leading to low enrolment and retention rates; on the other, low enrolment and retention rates hinder the learning process. The inter-linkage among these three aspects underscores the need for special attention to factors affecting education quality while addressing enrolment issues.

This paper attempts to study the elementary education scenario in fifteen major states of India in terms of enrolment, retention and quality. The states under study are: Andhra Pradesh (AP), Assam (ASM), Bihar (BIH), Gujarat (GUJ), Haryana (HAR), Karnataka (KAR), Kerala (KER), Madhya Pradesh (MP), Maharashtra (MAH), Orissa (ORS), Punjab (PUN), Rajasthan (RAJ), Tamil Nadu (TN), Uttar Pradesh (UP) and West Bengal (WB). Secondary data for the purpose of analysis has been primarily gathered from official statistics published by the

National University for Educational Planning and Administration (NUEPA) and different issues of the Annual Status of Education Report (ASER). Here it may be mentioned that no direct comparison has been made between NUEPA and ASER data since their bases are entirely different. The paper is organized as follows. Section 2 reviews some of the existing literature on the achievements and challenges facing the elementary education sector in India. Section 3 analyzes some important determinants of the learning environment in schools by constructing suitable composite indices. In section 4, an attempt has been made to study interstate disparity in learning achievements of students in primary grades by constructing a Learning Achievement Index. Section 5 concludes the paper.

2. Primary Education in India: Achievements and Challenges

It is observed that in almost all the states of India, there has been an increase in gross enrolment ratio (GER) at the primary level across all social groups between 2004–5 and 2007–8. The net enrolment ratio (NER) at the primary level also increased from 84% in 2005–6 to 96% in 2007–8 for the country as a whole (Planning Commission, 2011). This is primarily the result of a number of initiatives undertaken by the Government of India in recent years aimed at achieving UEE. One of the major schemes introduced by the government in the year 2002 was the Sarva Shiksha Abhiyan (SSA). It aims at providing basic education to all children in the age group 6–14 years while trying to bridge the social, regional, and gender gaps existing within the country, without any compromise in the quality of education. Another major step in this direction is the Right of Children to Free and Compulsory Education (RTE) Act 2009 which came into force from April 2010. With the enforcement of this Act, education has now become a fundamental right of every child in this country. However, it is to be noted that for India as a whole, 19 per cent of the children in the age group 6–17 years are still out of school (Planning Commission, 2011).

Retention rate poses another major challenge to the school education system in India. At the all-India level, average dropout rate at the primary level was 9.11% (9.35% for boys and 8.86% for girls) in 2008-09 (NUEPA, 2011). The high incidence of dropout in primary grades is also evident from the fact that the ratio of Grade V enrolment to Grade I enrolment was 71.86% in 2008-09. Moreover, mean years of schooling for the country as a whole was only 4.2 years in 2007-08 (Planning Commission, 2011). This is a matter of concern because children who do not complete at least five years of schooling are unlikely to retain literacy and numeracy skills in their adulthood thus adding to the pool of illiterate adults.

A combination of factors affects retention rates in schools. These include distance from home, quality of teaching, school facilities, economic costs, etc. Among the various reasons for discontinuation or dropping out, the three most important reasons identified in the NSS 64th Round Survey (NSSO, 2010) are lack of interest on the part of parents, lack of interest on the part of children, and financial constraints. These three factors together accounted for at least half of the cases of discontinuation or dropouts across all social groups. Among these, financial constraint was identified as the predominant factor for discontinuation/dropping out. Widespread poverty coupled with extremely low levels of public expenditure on education (especially on elementary education) makes this an obvious reason for dropout. Here it may be pointed out that the PROBE (1999) survey (De *et al*, 1999) argues that it is a completely wrong perception that parental indifference is a major factor that keeps children out of school. The survey found a high and growing demand for good quality basic education even among the poorest and socially disadvantaged communities. If parents seem disinterested in sending their children to school, it is largely because many schools are dysfunctional and little teaching-learning takes place there.

Although school facilities have been improving over time, much still remains to be done in this area. Close to half of all primary schools in India are still being run either in one or two classroom buildings (NUEPA, 2011). Although the RTE Act 2009 stipulates one classroom per class, India seems quite far from that goal. Lack of adequate sources of drinking water and poor sanitation facilities (particularly for girls) are the other major concerns for school infrastructure. Teacher shortage poses another major challenge to our school education system. The desirable pupil-teacher ratio (PTR) is 30:1. But nearly 12% of all schools have a PTR of more than 60 students per teacher (NUEPA, 2011). The problem is compounded by the existence of a large percentage of untrained teachers and high rates of teacher absenteeism in schools. In fact, the PROBE Revisited Survey (De et al, 2006) highlights lack of teaching input and inadequate contribution of teachers who are appointed as one of the most important challenges facing the school education system. Poor infrastructural facilities in schools and little teaching-learning activity result in high rates of student absenteeism. For the country as a whole, net attendance ratio (NAR) during the year 2007-08 at the primary and upper primary levels was 82% and 60% respectively (NSSO, 2010). Poor attendance rates adversely affect learning outcomes of students because regular attendance is one of the prerequisites of achieving a desired level of learning.

Poor quality of learning in schools is perhaps the most serious challenge facing the primary education system in India. Kingdon and Banerji (2009), based on a survey undertaken in Bihar and Uttar Pradesh, argue that the current level of learning attainment among children is a cause for serious concern. The paper observes that Grade IV students who had very low learning levels at the start of the school year (i.e. who had not mastered even Grade II level basic skills when they entered Grade IV) had little gain in learning throughout the year. The paper emphasizes the need to build strong foundations of basic learning in the early grades. The study also identifies factors like extremely low rates of attendance among enrolled children, high rates of teacher absenteeism, worrying levels of teacher competence, etc. as some of the major factors behind low learning levels of students. Similar conclusions have been reached by Govinda and Bandyopadhyay (2011) based on a survey of 88 schools of Madhya Pradesh and Chhattisgarh. They contend that poor learning level is one of the major factors behind exclusion from school education.

Another important change in India's school education system that has taken place during the past one-and-a-half decade has been the growing presence of private educational institutions. During the period 1995-6 to 2007-8, the proportion of students attending private-unaided institutions increased by 8 percentage points at both the primary and upper primary levels (Planning Commission, 2011). This has given rise to a debate regarding the quality and costefficiency of government schools vis-à-vis that of private schools. Kingdon (2007) suggests that the popularity of fee-charging private schools in India is explained by their superior quality. Muralidharan and Kremer (2006), based on a nationally-representative survey of rural private primary schools conducted in 20 states of India in 2003, also argue that children in private schools have higher test scores, even after controlling for observable family and school characteristics. They also find that private schools are more common in areas with poor public school performance. However, some studies argue that private schools are unaffordable to the poorer sections of society (Ha"rma", 2011) and may not always be qualitatively superior (Chudgar and Quinb, 2012; Bangay and Latham, 2013). These findings raise issues for serious policy deliberations. On the one hand, transforming education from a merit good to a market good might lead to increased efficiency; but, on the other hand, it might result in inequitable access to primary schooling for the children.

It is, thus, observed that increasing school enrolment does not ensure that children will learn in school and progress to higher levels of education. Specific measures are necessary to ensure that good quality education is imparted in primary grades.

3. The Learning Environment in Schools

There are several basic features necessary for creating an educational environment conducive to learning. These include easy accessibility of schools, enabling inputs (like more and better-trained teachers, availability of learning materials, etc.) and school facilities (like classrooms, drinking water, sanitation facilities, etc.). Learners' characteristics and their social environment, learning time (time spent by teachers and students in school) and a sound pedagogy (more child-friendly learning techniques, proper choice of language of instruction, greater emphasis on reading skills, etc.) also play a crucial role in influencing learning levels of children. In this section, an attempt has been made to analyze inter-state disparity in some important determinants of learning (as outlined in Table 1) by constructing suitable composite indices. The comparison has been made on the basis of DISE data for the year 2010-11 (NUEPA, 2012).

Table 1: Factors Influencing Learning Outcomes

DIMENSION	INDICATOR
	 Primary schools per thousand child population (6 to 11 years) Upper primary schools per thousand child population (11 to
Access	14 years)
	3. Density of primary schools per 10 sq. km.
	4. Density of upper primary schools per 10 sq. km.
	5. % of schools having drinking water facility
Physical	6. % of schools having girls' toilet
	7. % of schools having electricity connection
Infrastructure	8. % of schools having ramp
	9. Student-classroom ratio (SCR)
Human	10. % of professionally trained (regular) teachers
	11. Pupil-teacher ratio (PTR)
Infrastructure	12. % of female teachers
Learning Time	13. % of primary schools with more than 200 working days

(govt. and aided managements)

The first column of Table 1 shows the broad dimension that influences learning outcomes while the second column shows the indicators used for capturing that dimension. The indicators for the first dimension 'Access' capture both the spatial density of schools as well as their availability per thousand child population because more children will come to school only when they are easily accessible. Moreover, for creating a proper learning environment, schools must have certain basic facilities. The indicators for 'Physical Infrastructure' capture the availability of basic amenities in school. However, the ultimate aim of having good physical infrastructure is to facilitate teaching-learning activities in the school. This can be achieved only by increasing the availability of better quality teachers. The indicators for 'Human Infrastructure' include availability of professionally trained teachers as well as the pupil-teacher ratio. One of the provisions of the Operation Blackboard scheme launched in 1987 was to ensure that one of the teachers appointed would preferably be female as it is believed that female teachers can handle small children more efficiently. Therefore, proportion of female teachers has been included as an indicator for this dimension. The time spent by teachers and students in school also plays a crucial role in determining learning outcomes. But due to lack of data on attendance rates and time spent by teachers and students in school for the year 2010-11, percentage of primary schools with more than 200 working days (govt. and aided managements) has been used as a proxy for the dimension 'Learning Time'.

The method of construction of the indices is as follows. In the first step, the indicator values have been normalized by using the formula

Normalized Value = (Observed Value – Min. Value) / (Max. Value – Min. Value)
Upon receiving normalized values, the next step is to assign weights to the indicators which can be done in a number of ways. The simplest way is to assign equal weights to all the indicators. Or, one may judge the significance of an indicator and accordingly assign weights in a subjective manner based on the value judgment of an individual. Yet another way is to assign different weights to different indicators according to their statistical significance by using Principal Component Analysis (PCA)³. Here, a composite achievement index has been

³ Here it may be mentioned that Sengupta and Pal (2010, 2012) have constructed indices on educational poverty using the formula suggested by Anand and Sen (1997). This formula captures the idea that the impact of each deprivation increases as the level of deprivation increases.

constructed for each dimension where the weights of the indicators have been derived from factor loadings obtained by Principal Component Analysis. In this study, the first principal component has been able to explain more than 60% of the total variance in all the cases. Hence, component weights have been calculated on the basis of first principal component alone. The values of the achievement indices for the different dimensions for the year 2010-11 are shown in Table 2.

Table 2: Achievement Indices, 2010-11

States	Access	Physical Infrastructure	Human Infrastructure	Learning Time
AP	0.380	0.476	0.477	0.978
ASM	0.749	0.172	0.018	0.818
BIH	0.470	0.175	0.424	0.708
GUJ	0.290	0.795	0.622	1.000
HAR	0.350	0.784	0.525	0.980
KAR	0.466	0.705	0.604	0.995
KER	0.087	0.875	0.693	0.651
MP	0.490	0.337	0.368	0.954
MAH	0.284	0.662	0.555	0.993
ORS	0.650	0.286	0.372	0.881
PUN	0.697	0.846	0.624	0.971
RAJ	0.550	0.635	0.351	0.936
TN	0.322	0.771	0.779	0.999
UP	0.437	0.560	0.528	0.998
WB	0.413	0.391	0.265	0.000

Data Source: NUEPA (2012)

Next, the states have been categorized as *good performers* and *poor performers* on the basis of achievement indices for each dimension (Table 3). States showing a value of achievement index greater than or equal to the median value have been categorized as *good performers* and the rest have been categorized as *poor performers*. The table also shows the number of dimensions in which a particular state shows good performance. It is observed that Karnataka and Punjab are good performers in terms of all the four dimensions while Gujarat, Haryana, Maharashtra, Tamil Nadu and Uttar Pradesh are good performers in three dimensions. On the

other hand, West Bengal shows poor performance in all the four dimensions while Andhra Pradesh, Assam, Bihar, Madhya Pradesh and Orissa show poor performance in three dimensions. Kerala and Rajasthan show good performance in two dimensions.

Table 3: Categorization of the States based on Table 2

	PERFO	No. of			
States	Access	Human Infrastructure			dimensions in which the state shows good performance
AP	Poor	Poor	Poor	Good	1
ASM	Good	Poor	Poor	Poor	1
BIH	Good	Poor	Poor	Poor	1
GUJ	Poor	Good	Good	Good	3
HAR	Poor	Good	Good	Good	3
KAR	Good	Good	Good	Good	4
KER	Poor	Good	Good	Poor	2
MP	Good	Poor	Poor	Poor	1
MAH	Poor	Good	Good	Good	3
ORS	Good	Poor	Poor	Poor	1
PUN	Good	Good	Good	Good	4
RAJ	Good	Poor	Good	Poor	2
TN	Poor	Good	Good	Good	3
UP	Good	Good	Poor	Good	3
WB	Poor	Poor	Poor	Poor	0

Table 4: Correlations among Gross Enrolment Ratio (GER), Transition Rate (TR) and Determinants of the Learning Environment (2010-11)

	A 22222	Human	Physical	Learning
	Access	Infrastructure	Infrastructure	Time
GER (primary)	0.617*	-0.649**	-0.810**	-0.324
TR (primary to upper primary)	-0.106	0.391	0.550**	0.353

^{*} Significant at 0.05 level (2 – tailed)

Table 4 shows the correlations among Gross Enrolment Ratio (Primary), Transition Rate (Primary to Upper Primary) and the achievement indices of Table 2 for the year 2010-11. It is observed that states showing higher enrolment rates generally have better school access; but they do not always possess the requisite physical and human infrastructure facilities. In fact, high and significant negative correlation of Gross Enrolment Ratio with human and physical infrastructure indicates that states making rapid progress in enrolment rates are doing so at the cost of poor quality education. The table also shows moderately high and significant positive correlation between Physical Infrastructure and Transition Rate (TR). Hence, there is an urgent need to improve school facilities so that children who are enrolled in schools can be retained in the system and they can progress to higher levels of education.

4. The Quality of Learning in India

In India, no national level data on learning achievements were available until 2006. *Pratham*, a non-government organization, has been carrying out annual surveys on learning achievements of children in rural India since 2005. These surveys show that, for the country as a whole, 54.1% of children in Std. III-V can read Std. I level text or more and 40.7% can do subtraction or more (ASER, 2012). Further, on an average, only 27% of Indian children who complete primary school can read a simple passage, perform division, tell time, and handle money, although students should master each of these skills by the end of the second year of school (ASER, 2012). The situation is worse in many states. It is also observed that learning levels decline as one moves from lower to higher grades. This seems to support the findings of Kingdon and Banerji (2009) that 'learning delayed is learning denied'.

This section takes a look at inter-state disparity in learning achievements of students in the major states of India. For the purpose of analysis, a Learning Achievement Index (LAI) has been computed on the basis of ASER data for the period 2008-2012. The LAI is based on

^{**} Significant at 0.01 level (2 – tailed)

four indicators that capture the basic reading and numeracy skills of children in primary grades. The four indicators are – (a) percentage of children in standard I-II who can read letters, words or more, (b) percentage of children in standard I-II who can recognize numbers 1-9 or more, (c) percentage of children in standard III-V who can read standard I text or more, and (d) percentage of children in standard III-V who can do subtraction or more. The method of construction of LAI is the same as that discussed in section III. However, in this case Principal Component Analysis yielded approximately equal weights for all the four indicators.

Table 5: LAI for the Major States (2008-2012)

States/ Year	2008	2009	2010	2011	2012
AP	0.649	0.573	0.611	0.756	0.785
ASM	0.366	0.350	0.261	0.256	0.299
BIH	0.390	0.351	0.281	0.157	0.168
GUJ	0.291	0.259	0.353	0.456	0.358
HAR	0.547	0.643	0.685	0.665	0.690
KAR	0.423	0.468	0.387	0.542	0.582
KER	0.919	0.936	1.000	0.965	1.000
MP	0.974	0.977	-	0.050	0.069
MAH	0.774	0.901	0.858	0.793	0.554
ORS	0.473	0.658	0.276	0.238	0.250
PUN	0.613	0.723	0.748	0.839	0.824
RAJ	0.253	0.218	0.178	0.183	0.150
TN	0.0156	0.081	0.026	0.176	0.210
UP	0.069	0.041	0.032	0.100	0.088
WB	0.548	0.587	0.574	0.603	0.541

Note: Data not available for MP for the year 2010

Table 5 shows the values of LAI for the major states during the period 2008-2012 while Table 6 shows the categorization of the states on the basis of Table 5. As before, states which show a value of achievement index greater than or equal to the median value have been categorized as good performers and the rest have been categorized as poor performers. From

Table 6, it is observed that the states of Andhra Pradesh, Haryana, Kerala, Maharashtra, Punjab and West Bengal show good performance consistently while Assam, Bihar, Rajasthan, Tamil Nadu and Uttar Pradesh are consistent poor performers. Surprisingly, Tamil Nadu, which is known to be a good performer in terms of social attainments, shows very poor performance in terms of learning levels. Another interesting point to note from Table 5 is that Madhya Pradesh, which was the best performing state in 2008 and 2009, moved to the bottom position in 2011 and 2012. The index could not be constructed for Madhya Pradesh for the year 2010 due to unavailability of data. Further research is needed to analyze such drastic fall in learning levels in the state.

Table 6: Categorization of States based on Table 6

Year	Good Performers	Poor Performers
2008	AP, HAR, KER, MP, MAH, ORS, PUN, WB	ASM, BIH, GUJ, KAR, RAJ, TN, UP
2009	AP, HAR, KER, MP, MAH, ORS, PUN, WB	ASM, BIH, GUJ, KAR, RAJ, TN, UP
2010	AP, HAR, KER, MAH, PUN, WB	ASM, BIH, GUJ, KAR, ORS, RAJ, TN, UP
2011	AP, GUJ, HAR, KAR, KER, MAH, PUN, WB	ASM, BIH, MP, ORS, RAJ, TN, UP
2012	AP, GUJ, HAR, KAR, KER, MAH, PUN, WB	ASM, BIH, MP, ORS, RAJ, TN, UP

In the face of the growing presence of private schools in India's school education system, an attempt has been made to relate the learning achievements of states to the 'proportion of children in private schools' (Table 7). We find that there exists a positive correlation between LAI and the 'percentage of children in private schools' although the coefficients are not significant for the first three years. However, since 2010, not only do we observe increase in the absolute value of the correlation coefficients, the coefficients are also significant for 2011 and 2012. This points toward the growing importance of private schools in the Indian school education system.

Table 7: Correlation between LAI and % of Children in Private School

	LAI 2008	LAI 2009	LAI 2010	LAI 2011	LAI 2012
% Private 2008	0.195				
% Private 2009		0.178			
% Private 2010			0.423		
% Private 2011				0.475*	
% Private 2012					0.490*

Data Source: ASER

^{*}Significant at 10% level

However, proliferation of unrecognized private schools needs to be dealt with very carefully as these schools are not regulated by any kind of central authority and this can have serious repercussions on the educational rights of poor children.

5. Conclusion

It is observed that although India has made considerable progress in terms of enrolment at the primary level, it still faces serious challenges like high dropout rates, acute shortage of trained teachers, inadequate infrastructural facilities in schools, low attendance rates of both teachers and students, and poor learning outcomes of children. This paper has tried to study inter-state disparity in terms of four important determinants of learning – accessibility, human infrastructure, physical infrastructure and learning time. The paper finds that states like Karnataka and Punjab show good performance in all the four dimensions while West Bengal shows poor performance in all the dimensions. It is also observed that states showing higher enrolment rates generally have better school access; but they do not always possess better physical and human infrastructure facilities. This seems plausible since better access helps in bringing more children to school, but that does not guarantee a better learning environment in schools. In fact, high and significant negative correlation of gross enrolment ratio (GER) with human and physical infrastructure indicates that states rushing to meet enrolment targets are ending up imparting poor quality education. This is adversely affecting the learning outcomes of children.

The ASER reports show that majority of children (at the primary level) in rural India lack basic skills of reading and numeracy needed in day to day life. What is even more alarming is the fact that learning levels have declined at the primary level in most states during the period 2005-2011 (ASER, 2012). This paper has constructed a Learning Achievement Index (LAI) for the major states of India on the basis of ASER data. On the basis of LAI, it is observed that Andhra Pradesh, Haryana, Kerala, Maharashtra, Punjab and West Bengal show consistently good performance during the period 2008-12 while Assam, Gujarat, Rajasthan, Tamil Nadu and Uttar Pradesh are consistently poor performers. Surprisingly, Tamil Nadu is a state that is known to have achieved development via the social route. However, consistently poor learning outcomes cast doubts on the actual quality of social infrastructure in the state. Drastic fall in learning levels in Madhya Pradesh is also an issue that needs to be looked into more closely.

Poor learning outcomes are, however, not specific to India alone. It is a global phenomenon common to most developing countries. Pritchett, Banerji and Kenny (2013) have, in fact, argued that expanded enrolments can actually harm overall learning outcomes if quality is not maintained. However, it is yet to be seen whether this feature is characteristic of a transition phase or a serious challenge facing the education sector. Nonetheless, the government needs to design specific programmes aimed at raising the quality of primary education in India. Only then can education be a component of human development in the true sense.

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