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CAPABILITY BUILDING
THRO REINVENTING
THE EDUCATION INFRASTRUCTURE

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Abstract:

India's density of population is 10.5 times that of USA and 2.3 times that of China. This implies that India has to achieve far higher productivity than USA and China in every field of its activity. In our strategic plan to achieve competitiveness we need to give utmost priority and importance to developing human resources. This puts the emphasis on the education infrastructure of the country.

This paper looks at the evolution of the education infrastructure in India thro the ages. It explores the inadequacies of the system vis-à-vis the current needs of the society. In doing so it looks at the school and university level education systems. Based on an analysis of these, it lists a series of action plans to revitalize the education system.

The action plan envisages seven major steps: [1] Involvement of all sections of the society because the transformation needs to be achieved very fast and we need to harness the resources of all. [2] Deregulation of the education system to facilitate investment and entrepreneurship into the sector. [3] Sustainability: The system cannot be expected to survive on crutches, it needs to be self-sustaining. [4] Financial facilitation: Large number of students aspiring for higher education in tune with their aspirations would require financial support; we must create structures that provide and support these. [5] Customisation of programs to market needs. Hitherto the programs are standardized without regard to the market needs; we need to create programs that match the specific market needs. [6] Attracting talented people into teaching by creating ample growth avenues for the discerning, weaning out those not talented and rewarding them suitably. [7] Quality up-gradation on the basis of global benchmarking.

Preamble:

Comparative resource analysis of India with some of the leading countries gives a very interesting picture. India has 3.5 times the population of the USA while USA has three times the land area of India. This makes the population density of India at 10.5 times that of USA. China has 1.3 times the population of India while it has 3.1 times India's land area. This makes the density of population of India at 2.3 times that of China.¹

This has far reaching implications. In the first place for long term sustainability and growth, India needs to achieve far better levels of productivity than China and USA. In the second place India's growth strategy should use human resources as the most potent resource. This would call for emphasis on skill development and higher investment on human resources.

Better prosperity results from better wealth creation; better wealth creation comes from more determined initiatives and efforts; these result from better aspirations: collectively and individually. This is possible from better education which is possible only with better education infrastructure.²

This article looks at the status of the education infrastructure in India and how it can be reinvented to be in sync with the needs of the time.

Education Infrastructure in Ancient India:

From time immemorial, India is known for its learning. India's name and fame was synonymous with its emphasis on learning, knowledge and the great centers of learning like Nalanda and Takshashila. While these centers of learning flourished as shining examples, they were invariably supported by well laid out network of learning infrastructure that spanned the length and breadth of the country. The salient features of this infrastructure are worth listing.

- a. **Integrated, specialized:** The system of knowledge the ancient Indians possessed was holistic and integrated. These were included or were part of the Vedas. For instance the science of healthcare, Ayurveda in Sanskrit, included the knowledge of physiology and anatomy, it included the knowledge of the flora, fauna and the ecology, it included the knowledge of the climatic changes and a lot more. Just as it was integrated into a whole known as the Brahman, it had its specializations as well: whether it was music, or healthcare, whether it was astronomy or statecraft, whether it was the science of war or ethics.
- b. **Spread across the country:** There were centers of excellence like Nalanda and Takshashila that emerged at specific times with each having its golden period at different times. But the education infrastructure was not solely dependant on these centers of excellence. The infrastructure was people centric; wherever there were people there was the infrastructure. In fact it was teacher-centric: each teacher formed the node of the education infrastructure. These nodes were spread across the country which was predominantly rural. In fact the teachers – the Gurus- established themselves far away from the urban clusters, in the rural areas and very often in the uninhabited forest areas. The elites sent their children for education to such teachers situated far away from their urban homes. These schools of learning were characterized by their Spartan/simple living conditions and closer-to-nature existence. The education infrastructure needed no costly equipments, nor massive investments; all they needed were the knowledge and dedication of the teachers. Add to this the

commitment of the pupils and you have a great center of learning. The knowledge was not stored in great libraries; they were stored in the memory cells of the teachers who made the pupils learn by rote memory and practice those principles in life. Part of the learning was from the teacher, part from the texts, part from experimentation and part from life.

Even in an age when communication and transportation infrastructure was almost absent, the education infrastructure existed in every nook and corner of the country with very little variation in the basic texts and sources of knowledge. This signifies the high level of discipline in the process of education adopted by each of the teachers and instilled in each of the pupils. The process of education was not easy and hence only those who were highly motivated, dedicated and accomplished achieved proficiency to become next generation of teachers. Others were counseled by the teacher to take up professions that suited their capabilities, nature and genius.

- c. **Low cost, appropriate technology.** The education infrastructure by its very nature envisaged no significant investment of any type. The real and only investment was the teacher and his infinite knowledge. The teacher could establish his school anywhere it suited him. In fact most schools were far removed from normal human habitat. The tools and techniques used in education did not envisage any high technology; they envisaged very high level of improvisation and were very much in tune with the nature.
- d. **High level of dedication:** The education infrastructure existed on the solid premise of the dedication of the teachers. In those days teachers were those who had dedicated their lives in the cause of learning and education without expecting of any reward. They lead a simple life; their satisfaction was the achievements of their pupils only. The pupils also came to the teachers in abject dedication and surrender. This was perhaps an era of dedication
- e. **Systems of preserving and transmitting knowledge.** Knowledge was preserved through memorizing; it was transmitted orally to pupils who in turn memorized the same. They used memory to a great extent. This was the ORAL tradition of learning: *shruti* and *smruti*. The texts were written on palm leaves for preservation. There were hardly any other means of preserving knowledge.
- f. **Knowledge was highly customized.** Though knowledge was integrated it had permeated into every branch of human activity: be it carpentry or the science of animal health, be it cookery or music.

This infrastructure prevailed in the first millennium and perhaps the major part of the second millennium. External aggressions affected mostly the urban centers; the rural areas and hence the nodes of education infrastructure were unaffected. In the later part of the second millennium the Europeans brought in products and culture of the industrial

revolution; this began to impact the education infrastructure of India on a long term basis. The industrial revolution, as it unleashed in Europe, created organized production systems called factories; these needed mass participation of the people in the form of workers. The workers needed to be educated and trained uniformly and quickly. This was the genesis of mass education and the beginning of the concept of organized schooling. When the Europeans came to India, and started making long term inroads into the Indian ethos, its education system could not remain unaffected.

McCaulay's new Education Infrastructure.

The Europeans came to India as traders, but soon enough, the English found themselves ruling vast areas of the country. The English needed people to man the raj; it was not feasible to bring them all from England. So they initiated the creation of an education infrastructure in India. This was based on the system prevalent in the Great Britain and modified to suit the requirements of the raj. The salient features can be listed as

- a. Rhymed with the requirements of the Raj
- b. Replicated a modified version of the British system
- c. It reflected the needs of an emerging industrial society.

Modifications in the post-independent era.

Independent India realized the need for spreading literacy and education. The result was the creation of large number of universities. With state re-organisation every state created its own secondary education boards.

With the object of taking education to the larger masses, medium of instruction was increasingly switched over to regional languages. This paved way for increasing emphasis for the regional languages. Most of the schools adopted regional languages as the medium of instruction; some states did away with the English language even in the university level. Encouraging the regional languages by itself was definitely a desirable step but a parallel consequence was the reduction in the emphasis on English which later was found to be of some hindrance in keeping pace with the rest of the world.

With increasing demand for education, more and more colleges were created and affiliated to existing universities. The concept of campus universities could not reach the demand of all and hence had to be discounted to a large extent. This had some impact on the quality of education.

Another major trend was the politicization of the university system. Teachers became unionized just as students formed associations with political affiliations. This trend had devastating impact on the discipline and quality of the educational process both at the school and university levels.

To keep pace with the latest trends in education abroad, centers of excellence were created. The result was institutions like IITs, IIMs, RECs [later on called NITs], AIIMS, JIPMER etc at the university level and Model Schools, Sainik Schools, Kendriya Vidyalayas, Navodaya Vidyalayas etc at the school level. These Centers of Excellence were to be role models for other institutions in the country; they were to be the catalysts

of change towards excellence. The IITs, for instance, were based on foreign models and in the initial stages, their products did not find much demand or acceptability in the local market; with the result many of the graduates found it lucrative to go abroad. This led to the phenomenon of “brain drain”; which was a disappointment to the educationists and planners at that time.

The educational system envisaged that most of the expenses are picked up by the state with only a small fraction being passed on to the students. This system came about from the good intention of spreading maximum education to the maximum number of people. But it had the negative impact of the state bearing the entire burden. When the state was not all that comfortable with financial resources, sustaining, growing and expanding the educational infrastructure became a serious problem. This had its own long term impact on the quality and reach of the system.

The Present Status

- a. **Co-existence of different models.** Different models of education systems are functioning in various parts of the country and in various strata of the society. These different models and systems can be classified in terms of the social strata they are relevant and in terms of ownership patterns.

Social Strata	School Level	College Level
High End	Public Schools, Residential Schools etc	NIT, IIT, IIM, AIIMS, JIPMER etc
Low End	Govt. schools, Municipal Schools, Govt. aided Schools	Central and State Universities.

- b. **Parameters of Performance:** The quality of education would depend on the curriculum, the quality of the teachers, the monitoring mechanism, the resources available to the management of the schools, customer focus etc. Some description of these variables is given in the table below:

Variables	Factors Impacting Quality of Education
Curriculum	Who formulates the curriculum? Govt./Board of Sec. Edn. Influenced by the National Policy on Education and Political considerations.
Quality of teachers	Who Selects the teachers? Monitoring of Teacher Performance Structure and Payment of Salary Training and continuous up-gradation of teachers
Monitoring Mechanism	Role of the Management of the School Role of the Govt. agency
Resources	Govt. funding. Generally limited to salary; very little extra. Students pay very low or nil fees.

	Alternate sources. Only private schools can have some sources.
Customer focus	Is the education program geared to prepare the students for customer-centric skills? For a livelihood? How alert is the community? Demands of the community.
Governance: autonomy	Autonomy to the institution, its top management
Governance: Political influence	Extent of unionization among teachers, administrative staff, students etc. Significance of external, local factors in governance

- c. **The School system – Lower End:** The lower end of the society comprising of lower middle class and the lower class, are catered by government schools and government aided schools. These schools offer free education. They are funded by Government or its agencies. There are a number of schools in this category which are owned and managed by private bodies but funded/aided by government or its agencies. In all these schools the academic delivery is controlled by the state through the Board of secondary education. In the current context the possibility of variation in each of the parameters is very high; this places consistency in quality very uncertain. This is the predicament of the education infrastructure in this segment.
- d. **The School System – Upper End:** The higher end of the school consists of Public Schools and Residential Schools. Most of these are owned and managed by private entities. Some of them prepare students for the Secondary/Higher Secondary Boards set up by Govt. Some of them prepare for autonomous Boards like Cambridge etc. Invariably all these schools charge market fees and hence they are resource rich. They are autonomous in management, in selection of teachers and in admitting students. Their target segments are very demanding and hence they need to perform to attract and retain students. Their long term sustenance is dependant on their quality and performance. This ensures some semblance of quality in this segment.
- e. **The University System:** At the college level most of the universities in the country are established by the government- either by the central government or by any of the state governments. There are few deemed universities and private universities. Most of these universities have been affiliating colleges to its fold. Large number of the affiliated colleges are owned and managed by private bodies/entities. The parameters responsible for the quality of the academic delivery are more or less same as those listed earlier. A closer examination of the education system under the university system, based on these parameters, will show that there is wide variation of the quality and performance. Inadequate resources, absence of autonomy and external influences are the major factors causing the deterioration of the university system. This sums up the scenario in the lower end of the spectrum

- f. **The University System – Upper End:** At the higher end of the college level education infrastructure we have premium educational institutions that can be the pride of any country in the world. Some of them can be listed as IITs, IIMs, NITs, AIIMS, JIPMER, NID etc. Most of these will score well in any evaluation on quality and performance based on the variables listed earlier. These institutions are comparable to the best among its class across the globe. All of these have been created by the state [invariably the central government] and are open to the best talent in the country. Entry to these institutions has become highly competitive because of the skewed demand-supply situation in the country.
- g. **Free Access:** One curious outcome is that students from the lower end of the school system find it difficult to get into the higher end premium institutions in the college system because they are qualitatively outpaced in the entry level competition. If this trend is allowed to continue, it would only reinforce the social divide. Poor management and inadequate resources of the educational infrastructure are burning issues to be addressed.
- h. **Structure of Pricing:** Pricing of the education is another issue that needs looking into. The elite institutions created by the government charges very nominal fees even to persons who can afford to pay a higher price. This adversely affects the viability of the institutions and they need to depend on the government forever. It is desirable to make each institution self-sustaining so that they can develop and grow on its own. This means that we have to explore and identify appropriate revenue streams for each institution.
- i. **Relevance of Education:** The schools and colleges have been granting innumerable degrees, diplomas and certificates. But how many of these have been oriented to job needs of the market place? A careful examination will tell us that most of the degrees, diplomas and certificates do not qualify on this ground. We need to rethink on this aspect so that education becomes more relevant to the participants.
- j. **Digital Divide:** With the opening up of the economy the growth rates in various sectors have started to increase. The benefits of these are emerging only gradually. Early benefits are seeping into the organized sectors which are reaped by the urban middle and upper strata of the population. For instance if the banking system has become computerized and networked who is benefited immediately? If rail reservation is computerized and networked through the internet who is benefited immediately? If the stock markets are digitized who gets the early benefits? The trickling of secondary benefits will take some time before they reach the lower segments in the urban areas and the vast majority in the rural areas. In the mean time the urban upper segment achieves far better growth and upward mobility leading to a widening of the chasm between the two segments. This process has significant social repercussions and hence needs to be managed carefully. There must be deliberate policy efforts to speed up the trickling effects

on one side; on the other side policy efforts must be directed to enhance the capability of the lower segments so that they are able to absorb the benefits of the reform process faster and better. One of the main pillars of the capability building process is the creation of appropriate education infrastructure.

- k. **Leveraging of Resources:** Creating healthy education infrastructure requires significant investment in terms of financial resources, high quality teacher development, high profile academic management, innovation and creativity. Till now most of these were coming in or were allowed to come in only from the government and its agencies. Today the task at hand is too vast and the resources at the disposal of the government and its agencies are becoming increasingly limited. In this context it is pertinent to explore as how to leverage the efforts of the government and its agencies with resources from as many sectors and sources as possible so that the goal of creating a healthy, vibrant and appropriate education infrastructure is achieved smoothly and early.

Action Plan

a. Requirements of a good education infrastructure: Some basic characteristics are listed below.

1. Given the diversity of the country on various dimensions, the education system should offer a wide variety of choice in terms of curricula, academic delivery, medium and mode of instruction.
2. Education must make a person knowledgeable, a good citizen and equip him for a profession and livelihood.
3. Education must be accessible to all irrespective of geographical location, income, ethnicity, caste, creed, gender or anything else. Each stream of education would have its eligibility criteria in terms of intellectual capabilities and these must be the sole criteria of admission.
4. Financial supports and scholarships must be available to the needy to the extent of his/her needs. These must also specify minimum levels of performance. No student should refrain from educational avenues for want of financial resources.
5. Educational programs must aim to achieve the best/highest quality standards feasible in its stream. This should make them internationally competitive.
6. Educational programs must be structured in different modes to suit the specific requirements of different segments of the society so that each segment is able to avail of the facility without too much of a strain.

In view of the diversity of the country creating and offering educational programs to reach every segment is a great challenge. The following sections look at some of the structural changes that can facilitate an approach towards this goal.

b. Involvement of all segments of society: Creating a symbiotic educational infrastructure for the country is a gigantic task requiring huge investment, enterprise, innovation and creativity. This cannot be handled by the government alone for it is not the sole custodian of resources, nor enterprise, nor creativity. It can at best facilitate the involvement of the various segments of the economy in this Herculean task. So the concern shall be how to attract investments and entrepreneurs into the system, how to create structures that require optimum of investments, how to attract dedicated professionals and organizations towards the education infrastructure etc.

Other sectors interested, directly or indirectly, in an initiative like this are [a] corporates, [b] NGOs and [c] individual entrepreneurs.^{3,4,5.}

Corporates would have the financial resources; many of them would be interested in entering into this field as part of their perception of Corporate Social Responsibility. They could be attracted by tax benefits also. For this purpose government can come up with attractive schemes of tax-sops.

NGOs have the managerial capability to organize and manage institutions with limited or moderate resources because they, through selection and training, maintain a dedicated pool of manpower.

Individual entrepreneurs emerge from every sector of the economy and it would be desirable for the society to nurture and harness them into this gigantic task of creating a healthy learning infrastructure.

c. Deregulation: To let in more investments and entrepreneurs, the education system must be deregulated. Today all the secondary education boards are controlled by the government; they are segregated geographically- except the Kendriya Vidyalaya Sangathan. We should encourage more and more autonomous boards, some of them created out of private initiative. They need not be restricted by geographical areas. This would nurture competition among the boards in terms of curriculum, academic delivery etc. This would require strong monitoring mechanism by the government about matters of governance, broad education policy etc.

At the University level at present universities are created by acts of the legislature. It may not be feasible to spend the precious legislature-time on creation of each university; it would be prudent to create one single act by the legislature and create a system wherein new universities are created by the executive under special powers vested on it by the act. A parallel can be seen in the Companies Act. The Companies Act has been enacted by the Parliament. Company Law Board, formed as per the Act, incorporates and monitors creation and continuance of companies. We will have to come up with a Universities Act which should look after the creation, well-being, nurturing and growth of large number of Universities in the country. This will encourage an atmosphere for academic entrepreneurship from among educationists, professionals and corporate entities. This would inculcate competition in the sector and will offer wider choice to the people.

c. Sustainability: Any educational institution, whether it is school or college, secondary Board or university, can survive and grow only if it is able to sustain itself. This will imply that each such entity must have its own revenue streams sufficient to cover its expenses and create a modest surplus. This calls for a fresh look at the manner in which pricing is done for the educational services. When institutions become self-sufficient, they tend to grow, they are able to compete in the market and offer the best of services. This is not belittling the need to support the large number of students who need support to afford the educational services.

d. Financial Facilitation for students: This has to be addressed by creating financial support structures for all those who need support. We need to create scholarships, free-ships, loans, financial assistance etc in a variety of manners and types to accommodate the needs of different students. These may come from government and its agencies, private foundations specializing on educational funding, private corporate bodies etc. We need to create a large number of such agencies and their resources need to be regulated and pooled in so that no needy student is left behind.

e. Restructure the programs to match the market needs: The programs need to be restructured to meet the societal needs.

At present we follow the 10+2 system of schooling. At the Plus Two stage we could think of introducing a whole variety of vocational courses. Does not the country need carpenters, electricians, plumbers, mechanics, painters etc? Is it necessary that every student has to study physics, maths, economics and biology? Large number of vocational courses must be available as options; these must be combined with apprentice programs. This will equip the students for a livelihood immediately after completing the Plus Two stage. The options of vocational courses should consider the opportunities available in the immediate environment. This calls for a lot of autonomy, creativity and innovation at the school level.

In some of the advanced countries like Germany there is a system that a student can aspire for technical/professional education only after completing three years of apprenticeship which is after schooling. We could consider some variant of this system. This gives the student good exposure to the industrial/corporate scenario before he enters the professional program of BE or MBBS or any other. This will also ensure that only committed and motivated students enter the professional courses; another advantage is that the students would have a higher level of maturity and capability to absorb the technical subjects.

At the college level large number of students are enrolled every year in courses like BA, BSc, BCom etc. The contact-hours in these courses range between 15 to 25 every week. This gives a lot of free-time to the students. It is worthwhile to examine how part of the free-time can be utilized towards apprenticeship or meaningful employment. This would ensure that the student would be equipped for a job/livelihood by the time he completes the course.

The curriculum offered in all the courses need to be enriched to make the courses self-reliant in equipping the graduates towards the jobs/professions available in the market.

f. Attract talented and committed people into teaching: While teaching has been considered a noble profession, one is not sure that the best talents get attracted towards it. The reason is the decline in the dynamism and the shine of the education sector. To rejuvenate the system it is necessary to attract and retain the best talents. The teaching career must offer attractive career paths, good compensation and ample opportunities to excel. This would require that the structural capital of the educational system must be revamped. The selection of teachers has to be re-looked into.

The teacher training system has to undergo a systemic change. One year program of BEd has very little to offer. Same is true about the teachers training at the primary school level also. Research on teaching methodology has attained great advances globally; only we have not made any attempt to heed these advances. Performance appraisal of teachers and the reward system has to be revamped to encourage the creative and committed teachers.

g. Quality up-gradation: Quality standards need to be evolved and each school or college will have to be judged impartially. For this purpose autonomous agencies must be created who would specialize in the field educational research, training etc. The programs and institutions must benchmark with the best on national and global basis.

Tailpeice:

The WTO is already here, though we have not made any preparations to welcome it. We ushered in liberalization and reforms in the industrial sector only when we were pushed to the wall of financial bankruptcy. We do not seem to have realized the power of reforms in the educational sector; hence priorities of our policy makers seem to be elsewhere. The earlier we realize the significance and the earlier we act, the smoother will be the transition and the faster will be our progress towards economic development. If we do not act proactively, the tremors will happen from unexpected directions and the process of transition will be far more painful. One thing is clear: the process of transition is inevitable.

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Notes:

1. While this data is well-known, the dramatic way the implications were presented goes to the credit of Prof C Rangarajan in his Convocation speech at ICFAI Hyderabad on the 18 th Dec 2004.
2. In an editorial, The Economist [21st Sep 1999], had highlighted the dichotomy of resource-endowment and wealth-creation that is prevailing in India. It said that India had one billion people and a nuclear arsenal in the backyard; but India counted for nothing in the international arena. India's per capita income ranked 11th from the bottom in a cluster of 140 countries and its share in the international

- trade accounted for less than a percent. The obvious hint was at India's inability to manage its resources and further down its incapability in producing effective managers.
3. A similar idea is seen in the article published by Prof Bala Balachandran in the Business Today dated 16 January, 2005 [Educating the Poor Profitably].
 4. This author has published an article "Innovating for Competitiveness" in ICAI Journal of Management Research in May 2001. This article gives a blueprint for the symbiotic involvement of the various segments of society in rural development. The framework envisaged major focus on education and employment generation.
 5. C K Prahalad, in his book "Bottom of the Pyramid", talks about the corporate sector finding relevance and business-sense in catering to the lower end of the society. According to him the Bottom of the Pyramid [BOP] has a strength of 4 billion people globally and creating products and services to this segment means a huge business opportunity to the corporate sector. Such an attempt will bring in employment, income and purchasing power to the BOP segment.
 6. In a recent article, "Making India Globally Competitive", [Vikalpa, Vol.No.29, No.4, Oct-Dec 2004, IIM Ahmedabad], Jagdish Sheth has explored the eco-political dynamics of global competitiveness and ways of making India globally competitive. He has listed Industrial Policy, International Trade, Domestic Industry and National Infrastructure as the thrust areas for reengineering. He has not emphasized education infrastructure, but the significance of this segment cannot be undermined.

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