

Higher Education Policy in Developing Countries: India and Brazil

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Azarias Reda

1 Introduction

Education of society is arguably the most effective tool in transforming a country's economy. An educated work force with the necessary resources is vital in developing and maintaining living standards in a nation. This is especially true in emerging economies. At the heart of educating a society for economic development is higher level education. Higher level education in this case means education beyond high school, which often includes technical schools, undergraduate and graduate studies.

In this paper, we will look at the higher level education characteristics, challenges and policy in two emerging economies, India and Brazil. By some standards, these countries are doing better than most developing countries, and the goal of the analysis is to learn from these countries' experiences as well as suggest some policy improvements. Focus is given to India because of the availability of more information, as well as the fact that English is the working language of the government making reports and information more accessible.

We will start by providing some background information about the countries, and then delve in to various issues in the higher level education sector. Along the way, we will make some policy improvement suggestions, and comparisons to the more developed countries in the world. We will conclude by summarizing these patterns and identifying some action points that these countries, as well as other emerging economies, could take to improve the state of higher level education.

2 Country Profiles

India is the seventh largest country by geographical area and the second most populous in the world. Located in South Asia, it is a country of rich history and diversity. Home to the Indus Valley Civilization, the region has been at the center of prosperous trade for a very long time [15]. It was later occupied by the British Empire in the mid-nineteenth century and became independent only 60 years ago in 1947. India is currently a republic consisting of 28 states and it is the most populous democracy in the world. With a nuclear weapon and the twelfth largest economy at market exchange rates, it is a potential superpower in the region. India is a pluralistic, multilingual, and multiethnic society, as well as home to a diversity of wildlife in a variety of protected habitats. However, India still suffers from high levels of malnutrition and poverty. [7]

The Federal Republic of Brazil had one of the longest western democracies in Latin America. It is the fifth largest country by geographic area covering about half of South America, and the fifth most populous country in the world. It had been a colony of Portugal dating back to the sixteenth century, with independence in 1822. Brazil had been a republic since 1889, although the Congress dates back some 60 years before that. The federation consists of 26 states, and about 5,500

municipalities [14]. Brazil has a predominantly Roman Catholic society which is also multiethnic. Brazil is the biggest coffee producer in the world, and it is also known for its diverse flora and fauna [10].

3 A Closer Look at India

In order to understand the full picture in the higher level education in India, we also need to look at the characteristics of the economic and social forces, as well as the implications of these forces on public policy. In any country, there is a strong correlation between the educated work force and the economic and living standards. In 2006, the Prime Minister of the country underlined that it was not acceptable to have a supply constraint when it comes to skilled and educated labor in a country of a billion people. India had some success, particularly in the IT fields in the past few decades. These could be attributed to having a large population base with English skills as well as success of a few institutions that attracted the best and the brightest from this big population base.

3.1 The State of Higher Education

Education in ancient India was pretty advanced, and this can be seen from the Buddhist monasteries from the 7th century BC up to the 3rd century AC, which in structure closely resembled the medieval universities in Europe [16]. Until the 18th century, religious schools defined the three forms of higher level education, including the Hindu *gurukulas*, the Buddhist *viharas* and the Quranic *madararas*. When the British came over to India, they set up a network of schools that mimicked the western system, with the first college being founded in 1818 near Calcutta. When India became independent in 1947, there were 19 universities and several hundred colleges [8].

By 1980, there were nearly 150 universities and about 5000 colleges, with coverage of about 5%, i.e. enrolling that much of the eligible age group. Today, India has the largest system of higher education in the world in terms of number of institutions (numbering nearly 18,000 colleges and universities) while it stands third in enrollment next to China and the USA. This is explained by the average enrollment in Indian institutions, which is about 500-600 per institution compared to about 8000 in China and 3500 in the US.

There are different types of higher level institutions in India. Universities are established by the Parliament, and some institutions are given a degree granting power, and termed as deemed to be universities. A very important component of the Indian higher level education system is affiliation. There are thousands of colleges that are affiliated with bigger universities. These colleges do not have a degree granting power, however, their students take exams through the governing university and the degrees are granted by the university to which they are affiliated.

Growth in the education sector from 1980's onwards has mainly been through private and affiliated institutions (Figure 1). Some of the institutions took the deemed to be university route to get degree granting powers while a majority of them remain affiliated with other universities. The University Grant Commission (UGC) is the umbrella of the Indian government that deals with higher level education, and defines terms of affiliation and deemed to be universities through various acts and laws.

States could also establish private universities through legislation as allowed by the Constitution. Although, these had been generally successful, some states have taken this to the extreme. A good

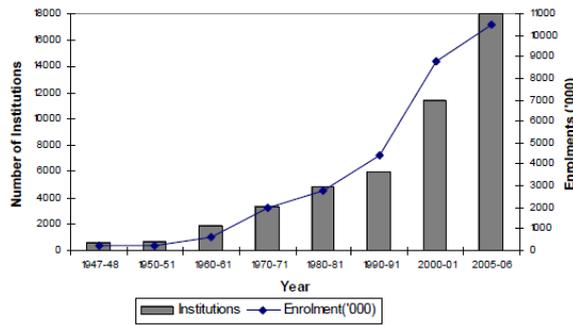


Figure 1: Growth of institutions and enrollment in higher education

example of that is the new state of Chhattisgarh in central India that allowed the setting up of 97 private universities just in the year 2002 [3]. This was quickly struck down by the Supreme court that left the fate of fifty thousand students hanging in the balance. Distance education has been another important avenue of higher level education in India. Each year, about 1.3 million students register for various courses in long distance education [11].

The past few decades in India have seen the shift of higher level education from being reserved for the elite few to the masses. The enrollment of women also has increased many fold since independence, accounting to about 40% currently. Literature in higher education coverage differentiates between elite higher education, which shapes the minds of the ruling class, mass education which undertakes the transmission of knowledge and prepares students for broad technical and economic roles, and universal higher education which is concerned with adaptation of the entire population to rapid social and technological changes [5]. Rough classification based on the gross enrollment ratio, which puts coverage less than 15 percent in the elite class, is where India falls in. As shown in figure 2, this compares poorly with the developed nations, such as US (83%), Australia (74%) and the UK (64%) [3]. The current enrollment in India stands about 9% GER, which is within range of countries with lower middle income.

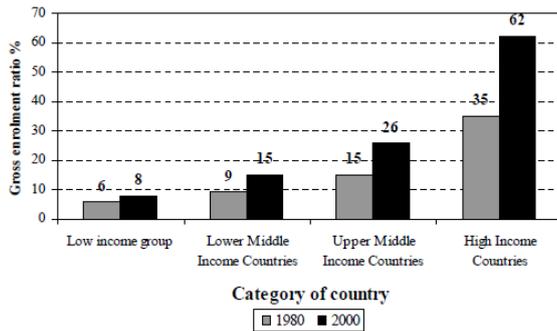


Figure 2: Gross enrollment ratio of various category of countries

In 2006-07 an estimated 13.9 million students were enrolled in institutes of higher education in

India, with 40% women. Also 35-40% of the students come from the lower socio-economic strata. The distribution of central and state universities into types of disciplines from the 2004-05 UGC annual report is shown in figure 3.

| Type | Number | % |
|------------------|--------|-----|
| General | 126 | 54 |
| Agricultural | 35 | 15 |
| Technological | 14 | 6 |
| Language | 11 | 5 |
| Medical | 9 | 4 |
| Law | 6 | 2.6 |
| Woman | 5 | 1 |
| Animal & Fishery | 4 | 1.7 |
| Open | 11 | 5 |
| Others | 16 | 5.7 |
| Total | 237 | 100 |

Figure 3: Different disciplines of study

3.2 Measuring Enrollment Rates

We can use three alternative means to measure rate and coverage of enrollment in a country. The first is the Gross Enrollment Ratio (GER) which is probably the most common one. This takes the ratio of enrolled students (whether or not they belong in a certain age group) to the total number of people in an eligible age group, usually 18-24. Net Enrollment Ratio (NER) takes the ratio of enrolled students that belong in an age group to the total number of people belonging in the age group. The Eligible Enrollment Ratio (EER) measures the ratio of students enrolled to those who completed secondary level education. The UGC reports that using the national sample survey for 2003-04, the GER, NER and EER are 13.3%, 13.2% and 59% respectively. Compared to a GER of only 0.7% in 1950, these numbers are quite high. Nevertheless, they still are very low in comparison to the developed nations.

3.3 Funding Issues

As in many nations, public funding of higher level education represents the majority of non-tuition based income for institutions, and this is especially important in public universities where tuition is reduced or non-existent. In India, public expenditure on higher level education has been about half a percentage point of the GNP for the past two decades. States provide most of the funding, accounting for about three quarters of the total funding, while the help from the central government mainly goes to about a hundred centrally funded universities. The UGC is the main funding body of the central government that administers the funds.

Another source of income for higher institutions is cost recovery program where there has been a shift from near exclusive dependence on government to some reliance on students and their parents as well. This is a global trend in developing nations, where higher education was once fully funded by taxpayers alone. Some forms of cost sharing arrangements around the world include [3]:

- Introduction of tuition fees (China 1997, Britain 1998, Australia 2001 and Germany 2005)
- Sharp rise in tuition fees(US)
- Imposition of user charges

- Encouragement of tuition dependent private higher education sector

The public expenditure per student is another point of comparison with other countries. Figure 4 from UNESCO Institute of Statistics provides this information for 2002-03.

| Country | Percentage of GDP on Higher Education* | Public expenditure on higher education per student (2002/03) | GDP per capita, 2002 (US\$) | Public expenditure per higher education student as percentage of GDP per capita |
|--------------|--|--|-----------------------------|---|
| USA | 1.41 | 9,629 | 36,006 | 26 |
| China | 0.50 | 2,728 | 989 | 53 |
| Japan | 0.54 | 4,830 | 31,407 | 17 |
| India | 0.37 | 406 | 487 | 83 |
| Germany | 1.13 | 11,948 | 24,051 | 43 |
| UK | 1.07 | 8,502 | 26,444 | 31 |
| France | 0.99 | 8,010 | 24,061 | 29 |
| Italy | 0.87 | 7,491 | 20,528 | 28 |
| Brazil | 0.91 | 3,986 | 2,593 | 52 |
| Russia | 0.62 | 1,024 | 2,405 | 11 |
| Canada | 1.88 | 15,490 | 22,777 | 48 |
| Korea | 0.34 | 1,046 | 10,006 | 5 |
| Indonesia | 0.28 | 666 | 817 | 20 |
| Philippines | 0.43 | 625 | 975 | 14 |
| Australia | 1.19 | 7,751 | 20,822 | 27 |
| Malaysia | 2.70 | 11,790 | 3,905 | 118 |

Figure 4: Public expenditure on higher education

As opposed to the developed countries, educational loans have not been a popular way of funding higher level education in India. With most of the growth in education coming from private institutions that depend on tuition, it seems like India would benefit immensely from a well structured student loan program that would make higher level studies more affordable to a wide array of students. A particularly effective way could be an income contingent loan structure where the government bears some level of responsibility and assumes the risk of inability to get employment by graduates.

Expenditures in research account for a significant portion of government educational funding in many developed countries. One of the indicators of research strength is the number and quality of publications that come out of a country. A ten year analysis of the trends in publication counts, that is publications in refereed scientific and technical journals, shows that India accounts for about 2% of the world's publications [4]. The trend for a few countries is shown in figure 5.

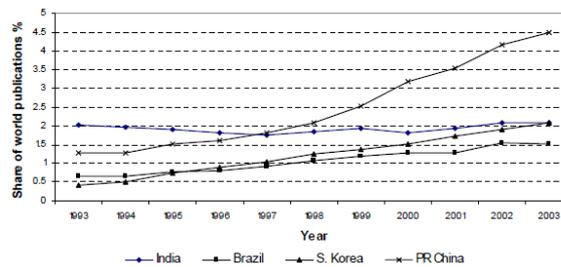


Figure 5: Comparison of publication trends

3.4 Preparing a Skilled Workforce

Despite the great need for a skilled labor in emerging economies, there is often a mismatch between the supply and demand of educated work force. This perhaps explains why the unemployment rate of college graduates in India, at 17.2% [12], is significantly higher than the rest of the population. This often results in educated people taking job offers that actually do not need higher level education, such as secretarial and clerical roles.

This disjoint between education and job opportunities should inform policy of a country. One such issue of discussion is whether higher education should teach students general skills and the ability to adapt and learn various roles (a la the liberal arts education in the USA) or train students to a particular field of study. This mainly depends on the economy, and how stable the major industries are. For an emerging market that is expected to have several changes and transitions, it might make more sense to equip students with the tools that would allow them to morph in to job opportunities as they become available. This is especially important as the job market often represents only the short term needs of the country.

3.5 Regulating Higher Education

Quality of higher education depends a lot on the quality of students in an institution. However, the quality of students that come to an institution in itself depends on the perceived quality of the institution. As a result, in higher education, the students both produce and consume quality, and prestige and branding are particularly important.

The UGC is once again the chief regulating body of higher level education in India. In fact it was established with a mandate of coordinating and determining the standards of universities. In addition, state boards, professional councils and affiliating universities also have a stake in monitoring education quality. Some of these councils include the Medical Council of India, All India Council for Technical Education, Bar Council of India and National Council for Teachers Education.

An interesting system of Indian higher education system is affiliation. Affiliating universities often have a defined geographical service area where they take colleges from. The responsibility of the affiliating universities includes determining and overseeing academic standards, administering centralized examinations, and prescribing curriculum to the affiliated colleges. As colleges can not grant degrees by them selves, all of India's nearly 18,000 colleges are affiliated to a few hundred universities. Colleges affiliated to a single university often have a common syllabus and administer a common examination at the end of the year.

| Details | Number |
|---|--------------|
| Total Number of Colleges | 17,625 |
| Number of Colleges under UGC purview | 14,000 |
| Number of Colleges recognized under Section 2(f) of UGC Act | 5,589 (40%) |
| Number of Colleges recognized under Section 12(B) of UGC Act | 5,273 (38%) |
| Number of Colleges actually funded by the UGC | 4,870 (35%) |
| Number of Colleges accredited by the NAAC | 2,780 (20%) |
| Number of Colleges accredited by the NAAC and scoring above 60% | 2,506 (17.9) |

Figure 6: Current quality status of colleges in India (march 2005) - Working Group on High Education for 11th 5 year plan

This system of affiliation, while enabling many institutions to grow and flourish in India, has

some disadvantages as well. One common complaint is that substandard institutions get to ride on the names of their affiliating universities. This is especially worrisome since it is possible for a college not to be accredited by itself, but still affiliate with an accredited institution and give degrees from that institution as shown in figure 6. In addition, when a university affiliates a large number of colleges, it is often the case that the weaker colleges determine the policy of the university when it comes to teaching requirements, examinations etc. This discentivizes other colleges from performing better.

3.6 Affirmative Action

The system of quota based reservation for admissions in educational institutions with a view to correct the injustices done to certain castes and classes of people is a concept that has been around in Indian politics, with similar criticisms and opinions as in the US. The Supreme Court has been involved a few times over there as well, resulting in the amendment of the constitution to extend quota based reservation for what they call 'backward classes'. The main reasoning behind this is that higher education is a very effective instrument for social mobility. One of the common issues raised with affirmative action is that with time, people will start considering this as an entitlement rather than a privilege, even when these policies are not needed anymore. However, it seems like those days are pretty far away, and the benefits of educating India's diverse population far outweigh the issues. It is also important to notice that affirmative action policies are much more effective at lower levels of education, and giving students equal opportunities to compete for merit based higher level education should be a priority.

3.7 Comparison of system with the USA

Figure 7 shows a comparison of the higher education system in India with that of the USA [3].

3.8 Recruiting and maintaining faculty

As in most developing nations, India faces problems with recruiting and maintaining faculty at institutions. The minimum qualifications and pay scale in India are determined by the UGC. Although there has been a significant increase in number of faculty in the past few decades, attracting and retaining good teachers remains to be a problem. This is especially true in engineering institutions where scholars often have better choices in the industry as well as out of the country. The ranks of academic profession in India include lecturers, readers and professors roughly corresponding with assistant, associate and full professorships in the US. Figure 8 from the UGC for 2004/05 shows the distribution of teaching staff in India for the fiscal year.

3.9 Success Stories

India has a few institutions with global fame. At the top of this hierarchy are the seven Indian Institutes of Technology (IITs) and six Indian Institutes of Management (IIMs). Getting in to these institutions often means much better later life opportunities. The entries to these institutions are however very hard, determined by a set of rigorous testing which is conducted by the institutions themselves. Unlike the USA, there is no one set of tests to be taken, but rather individual universities or a small consortia of them conduct their own testing. For IIT's this test is known as the Joint Entry Examination (JEE), and Indian high school students often spend years of preparation

| | United States | India |
|--------------------------------------|---|---|
| Size | Large and complex | Large and complex |
| Diversity | Highly diverse | Very little diversity |
| Role of Central (Federal) Government | Federal government has maintained an arms-length distance relationship with universities. The central government does not establish and maintain any institutions of higher education. It is responsible for majority of students' grants and loans almost half of the students receive federal financial aid. | Establish and provide grants institutions of higher education maintaining direct relationship with some of them. Small central funding for higher education largely goes for maintaining these institutions Very small central funding for the rest of the system. |
| Role of State Governments | Mainly authorise educational institutions to operate within states and license entry into certain professions; States prevent fraudulent practices of the higher education institutions and provide oversight of the minimum or threshold capabilities. | Most public higher education institutions funded by state governments. States have limited role in maintaining standards. Because of reducing funding role and weak oversight, states are considered as weak links in the Indian higher education system. Many state institutions operate outside the states |
| Higher education institutions | Strong commitment to internal accountability through regular programme reviews and systematic activities to assess student outcomes. | Commitment to internal accountability and external accountability (mainly to affiliating the universities) varies widely across range of institutions. |
| System | The federal government, the state governments and the voluntary accreditation agencies – called the 'Triad' play complementary roles with clear division of labour. Each carry out distinct activities with distinct purposes taking different paths to the same super ordinate goal of providing high quality education with diverse offerings and sound investment of public funds. | The central government, the state governments, largely statutory government controlled bodies like the UGC, professional councils and the universities (particularly the affiliating the afflicting universities) and the voluntary accreditation agencies create a multi-layered burdensome regulatory system trying to achieve often conflicting objectives. Due to poor public funding and weak regulatory mechanism |

Figure 7: Comparison with the USA

| | In University Departments & University Colleges | | In Affiliated Colleges | | Total | Percentage in affiliating Colleges |
|----------------------|---|---------------|------------------------|---------------|---------------|------------------------------------|
| | Numbers | Percentage | Percentage | Numbers | | |
| Professors | 16244 | 21.00 | 6.1 | 23708* | 39952 | 59.34 |
| Readers | 24468 | 31.63 | 23.8 | 94016 | 118484 | 79.35 |
| Senior Lecturers | 11850 | 15.33 | 15.1 | 59505 | 71355 | 83.40 |
| Lecturers | 22868 | 29.56 | 51.5 | 203425 | 226293 | 89.90 |
| Tutor/ Demonstrators | 1920 | 2.48 | 3.5 | 13927 | 15847 | 87.84 |
| Total | 77350 | 100.00 | 100.00 | 394581 | 471931 | 83.60 |

Figure 8: Distribution of teaching staff in India

and coaching. With acceptance rates lower than 2%, the preparation is very taxing and can cost Indian families a lot of money, hence the big private tutoring industry in India.

The IIT's were set up by India's first prime minister, Nehru, who imagined them creating the needed brain power to derive India's economy. The reality now, however, is that most of the graduates of these universities leave the country, often to the US. The global recognition that these institutes command have derived the success of the graduates, and made them very valuable on the global market. In 2002, for example, 178,000 high school students took the entrance exam with only 3,500 being accepted in to one of the seven campuses of IIT. Some of the products of IIT include the co-founder of Sun Microsystems, CEO of Citigroup, former CEO of United Airlines and several professors in top research universities of the USA. This includes 100% of our Indian computer science professors at the University of Michigan.

Based on this success experience, the 11th 5 year plan in India plans to construct up to eight more IITs, alongside 30 central universities and seven IIMs.

3.10 Initiatives by the government of India

India has been engaged in a number of initiatives aimed at improving the higher level education standards in the country. Some of these include:

3.10.1 Vocationalization of higher level education

This Involves offering career oriented courses, which is implemented in some 350 colleges. These are often criticized for not having enough depth, and do not have a lot of impact so far.

3.10.2 Autonomous colleges

The UGC has been working on increasing the autonomy of colleges to enable them to make curricular and examination reforms. Although the coverage rate of 10% autonomous colleges have not yet been reached, progress is happening.

3.10.3 Inter-university centers

These are meant to provide advanced research facilities to universities, and are made up of a handful of such centers. These had been very successful in providing research assistance in the areas covered.

3.10.4 UGC Infonet

This is a nationwide high speed communication network for information sharing, access to educational materials and distance education. This network connects about a 150 universities so far, and most of them have network administrators trained to operate on it. As more schools are added to the network, this is going to be more useful, and would improve information sharing.

3.10.5 Consortium based subscriptions

As subscriptions to scientific and technical journals are growing more and more expensive, this initiative enables institutions to access e-journals through a consortium. This is proving particularly important to researchers and graduate level students in the universities. So far it has been implemented for IEL on-line, ASCE, ASME, Springer Link, DEL and ESDU.

3.10.6 PIEHEAD

This initiative was introduced to collate efforts for promotion of Indian higher education abroad, and started in 2005. Although much has not been done in this regard, it could leverage Indians abroad and be successful.

3.10.7 Early faculty induction program

Financial incentives to those wanting to become teachers, and entice other to the profession. However, the incentives have not been big enough to attract large numbers, but could possibly be effective.

3.10.8 Quality Improvement Program (QIP)

Deputation of teachers for higher qualifications in good institutions. Even with coverage of small number of institutions, these programs have been very successful in helping teachers and have obtained support from the World Bank.

3.10.9 IIT Delhi-FITT

Concerned with marketing research results, and has been in place since early 90's. This has been very successful in marketing innovations and could be a good example for replication to other universities and countries.

3.11 Recent policy initiatives by the government of India

- Establishing more quality institutions, and increasing the public-private partnership among existing institutions
- Increasing funding to central universities and IITs, IISs, and other institutions that have a 'potential for excellence'
- Setting up of a knowledge commission and drafting of a national biotechnology plan
- Increasing efforts to transform India to a knowledge superpower
- Establishing technology vision of India for 2020
- Upgrading technical education system through World Bank Assistance

3.12 Policy Suggestions

- Improve funding structure, where not-for-profit private institutions can benefit from government spending
- Restructure student loans and make them available to more students, and associate repayments with employment
- Develop a national testing service so that students can focus on a small number of tests they have to take to enter higher level institutions

- Model successful institutions like IITs in enhancing other universities
- Revise the affiliation system so that colleges could be held more accountable
- Enhance the national regulation and quality assurance, as well as accreditation agencies to give students, parents and employers clear idea about colleges and universities.

4 Brazil

Higher education in Brazil has been facing a lot of similar challenges as in India. Some of the basic issues the Brazilian government has been working on include:

- Increasing coverage of education
- Restructuring funding mechanisms to support institutional autonomy and incentives for efficiency
- Regulating higher education to maintain quality
- Realizing the necessary political changes that affect higher education in the country

4.1 Status of Higher Education

The Ministry of Education (MEC) is the heading body of higher education in Brazil. In 1996, Brazil had a total of 922 higher level institutions with 57 federal, 74 state, 80 municipal and 711 private institutions [9]. Most of these institutions are located in the south or southeastern part of the country. The enrollment figures from the INEP (Instituto Nacional de Estudos e Pesquisas Educacionais), the National Institute of Education Studies and Research, for the year 1996 show that about 1.86 million students have been enrolled in higher education. Although the enrollment increased by 36% compared to 1980, the increase is barely keeping up with the increase in population, keeping the enrollment ration pretty similar (figure 9).

| Type of Institution | Enrollment Growth, 1980-96 | 1980 Enrollment | 1996 Enrollment | % of Total Enrollment: 1980 | % of Total Enrollment: 1996 |
|---------------------|----------------------------|-----------------|-----------------|-----------------------------|-----------------------------|
| Federal | 23% | 316,715 | 388,987 | 23 | 21 |
| State | 123% | 109,252 | 243,101 | 8 | 13 |
| Municipal | 56% | 66,265 | 103,339 | 5 | 6 |
| Private | 28% | 885,054 | 1,133,102 | 64 | 61 |
| Total | 36% | 1,377,286 | 1,868,529 | 100 | 100 |

Figure 9: Enrollment over the years

As both enrollment and population grew by about 37% during the time period, the GER remains about 10-11% between 1980 and 1996. For comparison, we can look at the GER for other Latin America countries from a 1995 UNESCO report on World Development Indicators in figure 10.

Although the majority of growth has been in the private institutions, they are often limited to the social sciences because the costs of setting up laboratories and other facilities for the hard sciences are often prohibitively high. However, these institutions have been vital in keeping up with the demand for higher education. This is especially important because getting in to the free federal

| Country | % of Age Cohort -- 1980 | --in Tertiary Education 1993 | % increase in 1980 coverage rate in 1993 |
|------------|-------------------------------|------------------------------------|--|
| Brazil | 11 | 12 | 9 |
| Argentina | 22 | 41 | 86 |
| Chile | 12 | 27 | 125 |
| Colombia | 9 | 10 | 9 |
| Costa Rica | 21 | 30 | 43 |
| Mexico | 14 | 14 | 0 |
| Peru | 17 | 40 | 135 |
| Uruguay | 17 | 30 | 77 |
| Venezuela | 21 | 29 | 38 |

Figure 10: Comparison with Latin America countries

and state universities is often very competitive, determined by hard entrance exams, known as the vestibular. With the increase in population and the number of Brazilians enrolled in high school, the demand for higher education might see a big increase in the near future.

Like India, universities or a cohort of them are allowed to administer their own entrance exams. They receive general guidelines from the central government, but there is no centralized examination. The number of entrance exams taken is also growing faster, and fostering a huge private tutoring and coaching industry. While these are not inherently problematic, the availability is limited to those students who can afford it. Once matriculated, the completion rate for an undergraduate degree in Brazil is a little more than half [1].

Salaries and retiree pensions account for a significant portion (80-90%) of higher education cost. Retirees are entitled to all personal benefits and full salary they had at the time of their retirement. This includes pay raises that active faculty get [17]. In addition, the Brazilian education system has about 1.5 technical and administrative personal per faculty member. This is higher in the public education system than the private institutions.

Most universities in Brazil are autonomous, subject to the rules and regulations. Federal universities are governed by rectors, who are chosen by the faculty and students. The 1996 National Education Law defines a university as an institution dedicated to the production and advancement of knowledge, having at least one-third of its faculty holding advanced degrees (Master's or Ph.D.) and at least one-third being full time. An autonomous institution can:

- Establish the curriculum
- Accept students who have not taken the vestibular
- Enter into contracts as legal entities
- Accepts gifts and funds
- Determine enrollment according to capacity
- Establish research programs

Student loans are another issue of concern in Brazil. Although the subsidized government loans provide the main source of public support for students attending private institutions, the programs are poorly managed and underfunded. The coverage is not where it should be either. Nonetheless, the loan program is popular and often an issue of political discussions. The Federal Bank of Brazil is the entity responsible to set the guidelines in student loans.

4.2 Policy goals

The National Education Plan, adopted in 1997, sets some lofty policy goals by recognizing some of the challenges facing higher education [2].

- Provide post-basic education to 30 percent of the population age 19-24
- Diminish regional inequity of opportunity in higher education
- Institute a formula funding for the public system based on the institution's ability to respond to student demand and develop research
- Establish a broad distance education-based system for continuing education
- Insure effective autonomy for institutions in research, teaching, and administration
- Diversify the evaluation system and promote the improvement of the quality of instruction
- Encourage the development of an effective accreditation systems
- Stimulate graduate research and double the number of researchers within 10 years
- Diversify access and augment the participation of students with special needs Integrate the goals for higher education with the goals for other educational subsectors

5 Conclusion

In this paper, we have looked closely at two developing nations' higher level education systems. India and Brazil have been doing relatively well, especially in terms of their technical higher level education programs. This is evident from some of their graduates who had significant success here in the USA and elsewhere. Nonetheless, the education systems in these countries face similar problems to other developing countries when it comes to expanding, maintaining and funding the system. Our goal in analyzing the systems in these counties was to learn about higher education in these countries and identify some lessons that can be taken elsewhere, as well as look at their current policy initiatives. Some fundamental problems include a big quality difference between private and public institutions, funding and structure problems, affordability and availability.

University entrance exams in these countries, as well as many other developing nations where there are only a handful of high quality institutions, are very high stakes. These are accompanied by costly coaching and tutoring programs that further put students from poor backgrounds at a disadvantage. Another problem is that these examinations are not centralized. While this allows the universities to find talent that is suitable to the institutions, it adds extra burden on students who have to take multiple tests to go to higher education. So, a first step could be establishing central examination boards made up of representatives from the universities in order to consolidate this exams.

Funding issues need to be addressed as well. Although this is tied to the spending power of the country, as education is a vital tool for the economy, governments need to take it more seriously. Universities also need to be accounted for the federal funds they receive. By incorporating some cost sharing mechanism with the students, institutions could supplement their income and use federal funds to increase the quality of faculty, infrastructure and research. In addition, funding

needs to reach deserving private institutions as they enroll a significant portion of the student body in these countries.

Student loans could be used to increase the availability and affordability of higher level education in these countries to a much better extent. The greatest entry to barrier for these kinds of loans is the risk of not finding employment upon graduation, and being unable to pay. The government can alleviate this in a number of ways. First, it can take the risk of unemployment after graduation, such that students will have a grace period until they find employment. Once employed, repayments could be done either directly or through a temporary tax increase. Another option is to let students pay back in service. For example, students can commit to serve the government for a period of time in needy areas of the country. This would be beneficial to all parties involved as graduates will get some experience while the rural areas will be served.

Another area emerging markets should look at is replicating the success that institutions like IIT in India and PUC Rio in Brazil have. This is especially true in areas like computer science and information technology. These fields require much less upfront capital compared to other engineering areas, but still hold a great value in the global knowledge market. By admitting top quality students, and requiring only reasonable tuition, an institution can train a wave of highly qualified professionals at the fraction of the cost. The most difficult part initially would be getting together the faculty needed to operate such institutions. However, once even one such institution is set up, the graduates could be used to fill the positions in similar institutions. Also, by forming partnerships with universities in the developed world, they can invite visiting scholars and professors to come and teach for a few semesters.

In general, higher education is very important in transforming a country's economy. With the increasing connectivity and globalization of markets, emerging countries have an opportunity to benefit from an educated work force more than ever. Learning from countries like India and Brazil that had some success in areas like information technology, developing countries can pave brighter futures for their citizens as well as the country.

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