Teacher Professional Development
In Mexico and India

A look at different national responses to the issue of teacher preparation and capacity building under new conceptions of science curriculum

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Introduction

On the threshold of the 21st century, schooling systems worldwide are in a flux. They are grappling with the mandate of training it’s future generation to function in a knowledge economy. This is a tremendous challenge as the teachers from this generation have themselves been a product of schooling aimed at mass producing input for an industrial society. The new competencies identified by the OECD point to a glaring gap between the demands of society and the capacity of teachers to answer to it.

In this paper, we present a framework to analyze different countries responses to this problem. We present two case studies of Mexico and India. We look at the demographics, history and culture of classrooms in both countries. Teacher professional development had incredibly tight spaces to navigate. Few teachers embody new competencies. Yet the preparation and capacity building of teachers is the keystone of national policy being operationalized into practice. We examine national educational policy for both countries and look at the different factors which influence practice.

The aim of this paper is to look at how different national responses to the same issue resonate with common features and yet are so radically different.
New competencies

OECD established through DeSeCo some key competencies for a well functioning society and acquiring a successful life of the citizens in every country. These competencies are related to the critical thinking and abilities for daily living of individuals. Although the document describing the competencies is new, the focus on competencies development has been in vogue since high stake evaluations tests, like TIMSS and PISA, have been pushing countries to prepare their students for them. We consider that both countries curriculum discourse will include the development of competencies.

Framework for analysis

We decided to examine national policies on curriculum and teacher professional development using science in elementary education as our example. Below is a list of factors that we chose to examine and a description of the structure of individual country profiles.

- **Basic Education**: In Mexico, the constitution now guarantees 10 years of compulsory schooling. In India, the constitution guarantees 8 years of compulsory schooling.

- **Curriculum Policy**: We look at documents for both countries outlining the national curriculum framework both as it pertains to teacher preparation and student participation.

- **Statistics**: We examine figures from official sources to determine gender gaps, teacher-student ratio, ownership of educational institutes and preparation level of teachers.

- **For each country**: We enumerate some different approaches for teacher professional
development and describe 2 case studies each.

We end with an analysis of the similarities and differences in the curriculum policies and the teacher preparation in both countries.
**Mexico**

**Facts:**

- Population 106,202,903 (July 2005 est.)
- Population of school going age: 29 million (3 to 15 years old)
- Literacy: 92.2% total population. male 94%, female 90.5%
- School enrollment in basic education: 24’571,760 million (9 grades)
- Expenditure on education: 7% of GDP
- Number of teachers in basic education: 1’072,537
- Teacher to Pupil ratio 1:25
- In primary education 92% of students attend public schools and 8% private.

**General aspects of Curriculum**

The Mexican educational system is ruled by a National Curriculum that mandates the goals, subjects and topics to be studied from primary to high school in all public and private schools. Teacher preparation is also provided by the government with the obvious goal of providing teachers the needed theories and contents promoted by the national curriculum.

Basic education in Mexico, until 1993, considered six years of primary level as compulsory, in 1993 three years of secondary education became mandatory; in 2004 one year of preschool was established as compulsory. By 2006 three years of preschool will be mandatory, this policy will force the population to have, at least, 12 years of education.

Curriculum had a major reform in the 1970s and did not change much until 1992 when the “Acuerdo nacional para la modernizacion de la Educación Basica” was signed between the federal government, the national secretary of education and the national teachers’ union.
—after a huge debate-. Part of the agreement included the reform of the curriculum and text books for the school year 1993-1994. The new programs of study underline the differences between the previous and the present curriculum, according to the objectives of the new programs there is an emphasis in constructing intellectual skills (reading and writing, oral expression, search and selection of information, application of mathematics to the real life). Each subject described in the programs emphasizes the acquisition of skills and competencies.

Teachers’ preparation is centralized as well, the curriculum is set by the secretary of education and is aligned with the national program of students depending on the level the teacher is studying. All the programs emphasize the development of intellectual skills (in the case of students) and competencies (for teachers) which, as argued by the analysts of the curriculum, is a major difference between the 1993-1994 plan and programs and

**Different organizational responses to in-service teacher professional development**

- Government: The under-secretary of basic and normal education at both the national and state level has a department for teachers professional development. With the 1993 reform, annual training programs were planned in order for the teachers to understand and put in practice the new curriculum and the use of the new text books. Besides this and other general courses, teachers have always been trained for new innovative programs promoted federally or locally.

- Other organizations: Some of the additional –optional- classroom programs are designed and promoted by other organizations which provide different in-service professional development for teachers. The approaches from either governmental or non governmental institutions are different;
they range from traditional lectures, in-situ courses to on-line long distance courses. There is a variety of courses posted in internet websites including the National and State Secretaries of education, the Escuelas Normales web site and decentralized institutions from the government. Most of the in-service professional development courses include incentives for the teachers to take them.

Two case studies of Science Education in elementary schools.

The national curriculum in science states the following:

“The study of natural sciences in primary level does not pretend to educate the child by formal and disciplinary means in the scientific arena, but to stimulate the capacity to observe, inquire and pose simple explanations to the events that take place in his/her environment.

Teaching contents will be gradual, through basic and approximate notions and not through complex concepts that exceed the comprehension level of the children.

The programs are based on four principles:

1) Link the acquisition of knowledge about the natural world with the education and practice of scientific attitudes and abilities.

2) Relate scientific knowledge with technical applications.

3) Emphasize subjects related with the preservation of the natural environment and health.

4) Relate topics of natural sciences with other subjects.¹”

¹ Plan and programs of study, 1993. Primary Education. Secretary of Public Education. Translated ‘literally’
La Ciencia en tu Escuela (Science in your school).  

This is an academic program promoted, coordinated and implemented by a group of scientists from the Mexican Academy of Science (AMC in Spanish). Its goal is to improve teachers’ attitudes towards math and science as well as the ‘update’ their knowledge of these disciplines. The AMC organized teacher courses of approximately 80 hours for interested teachers in the 5th and 8th grades. The first year of implementation (2001-2002), the program trained 250 teachers in Mexico City. For the second year, the number increased to 520 teachers in the capital and nine new states. In addition to the teacher courses, La ciencia en tu escuela included the assignation of assistants (college students) to the participating teachers in order to implement their learning into the classrooms and the organization of conferences for teachers, students and parents of the schools participating. The content courses not only focused on in-service teachers but also on pre-service teachers, which is an outstanding strategy for improving science education from the base.

This program requires a strong commitment from the scientists to provide teachers with professional development and at the same time build teachers’ engagement and commitment to the courses due to duration of the courses and the additional effort for applying the contents into classrooms. Weaknesses of the program include that it demands too much time from the teachers; some of teachers attend the courses not for personal interest but for the incentives provided (e.g. points in carrera magisterial).

It could also be argued that due to the preparation of the instructors the courses tend to focus more in contents than in pedagogical strategies, which is the actual concern of the government ant the teachers.

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2 www.amc.unam.mx
Hands-on Inquiry Science Systems (HOIS) 3

The project Hands-On Inquiry Science system in elementary schools has been working since 1998 as pilot project in six states of Mexico. It is promoted by a local NGO Innovacion en la enseñanza de la ciencia (INNOVEC) and so far it has trained over 3,000 teachers and has impacted 100,000 students.

This program is built on a learner centered system. The discourse and goals used to promote its implementation are based on the development of thinking skills and the creation of a scientifically literate and knowledgeable workforce. Its main characteristic is the adaptation of real scientific materials for children. Each student has her or his own materials in order to perform experiments related to a given topic for an amount of time. Teachers attend a 12 hour workshop on the use of the materials and receive a ‘teachers’ guide’ that will assist them through the use of the materials. Although the experience with this project is still limited, the professional development provided until now has shown that teachers do not feel comfortable with their knowledge content in science topics (even for primary level) but that they are specially concerned in how to teach such subjects. Teachers are aware of the discrepancy between what the curriculum asks for them to teach and what they are actually able to provide to their students.

Mexico in a nutshell

Last decade Mexico experienced many changes the first and most important is society involvement and awareness of the political condition, this situation led to many reforms included the education reform. For many years teachers union had an immeasurable political power in policy decisions, it was until 1992 when the union and the government set up a plan for the improvement of education; this agreement is considered as a water

3 www.fumec.org.mx
shed since it allowed for several other reforms to take place. Most of the discourse in Mexican documents demonstrate the government concern on improving the quality of education which is still a great challenge in all the country as it is in other parts of the world.
India

A few facts:\(^4\)

- Population: 1.08 billion
- Literacy: 59.5% (male: 70.2%, female: 48.3%)
- Expenditure on education: 4.02% of GDP
- Population of school going age: 300 million (5-14)
- School enrollment: 200 million (male: 55.9%, female: 44.1%)
- Number of Teachers: 5 million
- Teacher to Pupil ratio: 1:40
- Ownership: 75% government or private aided.

General Aspects of Curriculum

In India, education has always been based on a national curriculum framework but programs of study have been localized at the state boards of education level. Most of the practice emanating from the programs of study is driven by the high-stakes public exams to be taken at the end of grade 10 and grade 12. The constitution under the 86th amendment of December 2002 has made elementary education (ages 6-14) a fundamental right. Curriculum discourse has undergone regular revisions in the five decades since independence but the practice of it is still rooted in the British legacy. Curriculum frameworks now emphasize competencies and process over skills and content. It openly acknowledges the gap between the new competencies demanded in the

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\(^4\) Statistics from CIA Factbook (May 2005) and Govt. of India Official Educational Statistics (2002)
Different organizational responses to in-service teacher professional development

In this section, we look at the various organizational and institutional frameworks to provide in-service teacher training in India. We present the different types of organizations and present an example of some of them.

- **Government Education Departments**: Education has been on the concurrent list (both state and center are responsible for it) for almost two decades now. There is a national council (NCERT) responsible for structuring and arranging in-service teacher training. In 1993, an Act of Parliament established a National Council of Teacher Education (NCTE) as statutory body to provide oversight for in-service development. We expand on the role of this organization in a further section.

- **DIETs (District Institutes of Education and Training) & Colleges of Education**: While these are very active at the pre-service level (over 75% of the teaching force is formally trained) they play a minimal role in in-service teacher training. While some of them conduct short-term “refresher” courses for teachers, the schools are generally not supportive of teachers attending these courses during the school year. The teachers are required to do this on their own time. It is not part of their job time.

- **Educational Societies**: Educational Societies run more than one school. These are private schools but receive grant-in-aid for their students. (The system is similar to vouchers and the schools have no geographical relation to where the students reside). These societies organize summer workshops for their teachers.

- **Voluntary Agencies**: In India there are a large number of voluntarily agencies that work for the betterment of school education. These agencies arrange training courses for
practicing teachers sometimes with the help of education department, sometimes without their help. The work of these agencies usually remains limited to a certain region, and they focus on local specific problems. Since the members of voluntary agencies work as resource persons without any remuneration and teachers attend these courses on their own without demanding any conveyance charges, such course are often cost effective. We provide a case study in the next section of one such agency – Eklavya.

Teachers are typically not supported if they do take the initiative to participate in these programs (in terms of remuneration, substitute teachers being arranged to take their classes, etc.). On the contrary, many schools actually discourage teachers from taking time off for these programs. Because there are no arrangements available for teacher substitution, the burden of "keeping the children busy" simply falls on some other teacher's shoulders. Teachers who do take part in in-service programs carry back a "certificate of participation" but little more than that. Some schools may give an extra increment in salary at the end of the year, based on such certificates. No contact is maintained between the teachers and the resource providers following completion of the workshop or program, i.e., there is little by way of follow-up action. In-service teacher training is largely an unorganized effort.

**Role and Concerns of NCTE**

The broad mandate given to the NCTE is to achieve planned and co-ordinated development of the teacher education system throughout the country, the regulation and proper maintenance of norms and standards in the teacher education system and for matters connected therewith. The responsibility of regulating quality of teacher education through norms and standards came to the NCTE when teacher education system had already seen its mushroom growth. Teacher education underwent expansion in different parts of the country that too in heterogeneous conditions and was even used by some
institutions as a money spinner programme, as surplus of income over expenses could be ensured by running it in a diluted form. Role of NCTE was generally perceived as a threat, as it involved conflict of interests, and was opposed as it curbed unfettered freedom for exploiting teacher education for commercial purposes. By developing resource materials in print and electronic forms and distributing them to teacher education institutions NCTE has been playing a catalytic role in the process of change of teacher education and for making it relevant to the context of learning today. It is hoped that teacher educators will pick up the new ideas and that they will be able to reorient teacher education programmes for giving to the school system such teachers as can competently take care of education of children for the 21st century.

**Role of voluntary agencies – Eklavya**

About three decades ago, a group of young science graduates started a program to improve the teaching of science in rural areas in the Hoshangabad district of Madhya Pradesh, a state in central India. Eventually calling themselves Ekalavya, the name of a mythological lower caste archery expert, the group emphasized the importance of making science interesting and relevant to rural children. In response to this initiative, the state government at that time allowed them to try out their curriculum at government schools. Thus emerged the Hoshangabad Science Teaching Program (HSTP). It is based on an inquiry-oriented, experiment-based and environment-related child-friendly pedagogy. The program covers about 1,000 schools with around 2,500 science teachers and covers over 100,000 children every year.

The report submitted by the Evaluation Committee constituted by the Department of Education, Ministry of Human Resource Development, Govt. of India, after 20 years of it’s...
operation in 1991, to evaluate the implementation of Hoshangabad Science Teaching Program (HSTP) calls out as exemplary the teacher training process. Recognizing that teachers will need scaffolding to implement a curriculum alien to their ingrained way of thinking HSTP put in place a program of continuous teacher professional development. About 2000 teachers have been given an intensive training. Out of these a large group of Resource Persons have emerged, who in turn have been training other teachers. Periodical refresher courses and more important, a constant interaction with scientists, educationists, trainers, resource persons and fellow-teachers is a major component of the program. The concept of "Sangam Kendra", monthly meetings is providing the much needed strength to the program. The long standing success of this program has been it’s ability to empower regular science teachers with the inspiration to become one with the new pedagogical style. This response is a case study of a voluntary agency working with the local people and the government to set up an institutional framework for an ongoing teacher education program. The end of this story about HSTP however serves to underline the fact that curriculum is the most political of all aspects of education. In this case, the state government succeeded in shutting down this program in 2003 after much lobbying by a local politician. In spite of extensive institutional success and grass roots excitement, the political elite of that regime felt that the social science curriculum(which was a parallel program of HSTP) was based on a political ideology and that it was being used as a vehicle for political change. While political activism was not the aim of HSTP socio-political awareness was one of the framings used to design the curriculum and the instructional package. Ironically, the program was closed down under a state government whose philosophy is based not on fundamentalist Hindu principles but on secular ones. In researching this topic for the paper, I have come to change my opinion about whether curriculum is the most political of education’s dimension.
In a nutshell...

India has made great strides in education. She has used the bi-lingual legacy of the British rule to great advantage when positioning herself as a supplier of a technical and scientific workforce. Why is the larger picture still so dismal? The sheer size of the population makes any reform effort at the national level a near impossible dream. India will benefit from decentralizing educational policy making if it adopts national guidelines and delegates the operationalization of this agenda to the local decision making bodies.

The discourse being publicly disseminated resonates with international demands and definitions of new competencies.
Similarities and Differences

Mexico and India have the same subjects: Language, Math, Science, History, Geography, Civics, Art and PE as constants in school systems. The two countries are vastly different:

- Independence: Mexico – 1921, India – 1947
- Population: Mexico – 106 million, India – 1.08 billion
- Heritage: Mexico – Latin American, India – Aryan-Dravidian
- Educational Influence: Mexico – French & Spanish, India – British

The countries are so different in all these aspects but their curricula resonate with the same desire to expose the students to new competencies and change to a learner centered approach. We examine the countries responses on the following axes:

- **Quantity v/s Quality and Ownership of Educational Institutes:** (private v/s public education) Given the Mexican economical situation, 90% of the population attends public schools and just a 10% attends private schools in basic education. Both countries have great challenges in terms of assuring quality in education for all students. In the case of Mexico, the access to primary education is achieved, secondary education is still short in access but the discourse tells that the country is ready to take care of the access and is more concerned in the quality. This issue is the same for preschool, the access is not yet covered but the concern of the ministry is placed in the quality. In India on the other hand, access for the entire population is still an issue but the country seems to be concerned on both things, providing access to all but providing quality to those that are part of it. In both countries the cultural diversity within the country has occasioned the government to address other issues like local languages and they have both solved the problem in diverse ways. Mexico promotes bilingual education for indigenous communities enabling first the use of the native language and
as second language Spanish.

- **Gender Gap**: In Mexico there is no significant difference on grounds of gender in terms of school enrollment and historically this has been the case. India however has one of the worst gaps in male-female educational levels in the world. There are national policies aimed at reducing this gender gap which even today is at 15-25% across the different states.

- **Economic Basis for Reform**: Both countries seem to place learner-centered pedagogy and the acquisition of new competencies at the heart of their curriculum reform. There are minor references to economic advantages of reform. Both countries explicitly emphasize citizenship and identity issues. India in particular mentions that it has an international competitive edge provided by the content heavy curriculum and is unwilling to sacrifice that at the altar of the process heavy curriculum.

- **Teacher Professional Development**:
  - **Distance Education**: Both countries have some distance education programs in place. Even though the intent of the government appears to be to make ongoing professional development more accessible, enrollment figures indicate otherwise.
  - **Front and center on national agenda**: Mexico and India openly acknowledge the gap between the official dialog about the curriculum and the competencies of the teachers to achieve it. They are keen to provide the necessary strategies to breach it.
  - **Pre-service teacher preparation**: This is mandatory in both countries and over 90% of all teachers undergo some level of professional training. In Mexico, it is centralized whereas in India it is taken care of by Colleges of Education – governmental and private.
o **Incentives**: Mexico has some incentives built-in for the teachers to enroll in ongoing training programs as well as in evaluations. In India there is no mandated incentive or scheme of followup.

o **Institutional framework**: Mexico has some centralized framework and there is at least one week of required training every semester. India mandates 20 days/year as reserved for ongoing training but has not organized framework to deliver the courses.

o **Professional Status**: Both countries are aware of the need to improve the status of teachers professionally.

**Future Directions and Concluding Remarks**

We began research for this project unsure of how much material we would find for our respective countries. In conclusion, we can say that we are both amazed at how much of the official discourse is publicly available. While policy oriented research was available easily, practice oriented research was notably difficult to find. One official evaluation by the Indian government openly laments at the lack of research in an innovative curriculum reform project.

During the course, we were staggered at the immensity of the Chilean curriculum reform and impressed with the scholarship of the official discourse. After writing the paper, we are glad to report the similarities in the official policy. So if we allow the time that the order of magnitude difference in population across the countries demands then we still have hope that both Mexico and India will one day bridge the gap between policy and practice.
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