The value and feasibility of evaluation research on teacher development: contrasting experiences in Sri Lanka and Mexico

M.T. Tatto *

College of Education, Michigan State University, 513D Erickson Hall, East Lansing, MI 48824, USA

Abstract

This article discusses the value and feasibility of carrying out evaluation research on teacher development and uses as point of reference the author’s experiences in two countries, Sri Lanka and Mexico. In Sri Lanka, an evaluation study was designed to understand the effectiveness and costs of teacher development at the elementary level linking teacher preparation with classroom practice and student achievement. The study also evaluated costs and analyzed the possible impact of the results for future policy. The study in Mexico illustrates the challenges of doing evaluation research in an environment dominated by a central state and teacher union politics, and where systemic empirical research on teacher development has been rare. It constituted an initial attempt at looking at the content and the anticipated effects across different approaches to teacher development in Mexico. New calls for greater accountability and better understanding of the reach and limitations of general education worldwide are prompting systems to examine teacher development program effectiveness. In this analytical article, the author discusses strategies and possibilities in the emerging field of teacher development program evaluation. © 2001 Published by Elsevier Science Ltd.

1. Introduction

This article discusses two strategies to carry out evaluation research on teacher development and uses as point of reference the author’s experiences in Sri Lanka and Mexico where she has carried out evaluation research on teaching and teacher development (Tatto et al., 1991, 1993; Tatto, 1997d). In the education arena, it has been particularly difficult to demonstrate the influence of teacher development and to explain what factors are responsible for successes or failures. Indeed studies on teacher development have contributed little to understanding programs’ outcomes and how or why the observed outcomes occur (Galluzzo, 1995). The teachers’ opportunities to learn throughout the life cycle including what has been commonly termed pre-service and in-service preparation.
The study in Mexico illustrates the challenges of doing evaluation research in an uncertain environment dominated by a central state and teacher union politics and influenced by external modernization and economic forces. Under these circumstances, empirical research on teacher development has been rare, due in part to the centralized and private character of the governance and information systems in Mexico, and in part to the politicized nature of teacher related issues. Worldwide trends toward increasing educational quality, however, have prompted a closer look at Mexico’s educational system increasing possibilities for greater accountability and allowing a closer look at processes. These new tendencies have created openings in the system and prompted programs to internally examine their effectiveness. In contrast with the Sri Lanka study, the study in Mexico had a limited field based component. Nevertheless, it provided the opportunity to develop a strategy to assess (via existing documents) teacher development approaches across the country. As in Sri Lanka, the development of program profiles was the first step in this program evaluation and constituted an initial attempt at comparing the different approaches to teacher development. Empirical field-based research of the kind carried in Sri Lanka, however, is still necessary to provide reliable and accurate information for sound policy making as official documents and internal evaluations may not reflect reality. Although issues of context and its defining power in these two countries’ teacher development are of crucial importance, its treatment goes beyond the scope of this paper. For a discussion of the historical development of teacher preparation in Sri Lanka and Mexico and of the effects of these countries’ political economy on epistemologies of teaching and learning as addressed by these two studies, the author directs the interested reader to refer to publications the author has written as an outgrowth of this research in other scholarly journals (for the Sri Lanka study see Tatto et al. 1991, 1993; and for the Mexico study see Tattoo, 1997a,b,c,d). In the present article the objective is to outline the conceptual frameworks and methodologies used in these studies.

---

2 By different approaches to teacher development I refer to the methods and techniques used in teacher preparation and development, which may vary according to the nature and grounds of knowledge adopted by those who are charged with constructing teacher preparation and development programs.

3 Our measures of achievement were both qualitative and quantitative and were administered by individual researchers to the children in the sample.

slow-coming evidence of the impact of teacher development has made it difficult to learn from the experiences and innovations that have evolved around the globe. It also leaves teacher educators vulnerable to new fads and to political whim, as programs have not developed systems to enable them to prove their effectiveness in relation to their goals and costs.

The study in Sri Lanka, was designed to understand the effectiveness and costs of three approaches to teacher development (teacher colleges, colleges of education, and distance education) at the elementary level linking teacher preparation with classroom practice and student achievement.2,3 The study also evaluated costs and analyzed the possible impact of the results for future policy. The methodology developed needed to support a research study in a relatively short time (e.g. as opposed to a longitudinal study) and under conditions made difficult by the country’s growing social unrest. A cross-sectional, quasi-longitudinal design and detailed data on the teacher-learners’ background, previous and current experience and knowledge, provided sound information on the differential value of the approaches studied to make policy recommendations. Carrying out longitudinal research — although desirable — is often times difficult and costly. The experience in the Sri Lanka study provides an example of the use of a methodology that made possible for researchers and policy makers to capture the effects of teacher preparation in a short time frame without sacrificing understanding the richness of the context in which these programs were implemented. A key factor in the study’s success was the development of the essential collaboration among a team of international teacher educators and researchers willing to engage in a mutual process of learning.
2. Salient issues in the study of teacher development

Research on the effectiveness and costs of teacher development in developing countries (and indeed worldwide) is rare (Bressoux, 1996). Reasons for this may be found in the history of the evolution of teacher education. Teacher education developed in parallel to the worldwide expansion of national education systems after World War II (Meyer et al., 1993). The idea that more education would bring about modernization or a healthier economy has dominated the educational agenda of many governments across the world (Fuller and Clark, 1994). Quality of education was a subordinated priority to quantity — a direct result of policies seeking to improve educational access. But as access issues were addressed by school expansion policies, it became evident that expansion had come at the expense of quality (Fuller, 1986). In many countries repetition and drop out levels are soaring while educational achievement tests reveal deficient learning levels (Lookheed and Verspoor, 1991). As problems of educational quality grow, more governments are looking for strategies to increase the quality of the education they provide. Teacher education has figured intermittently among those strategies. Indeed as notions about teaching practice and pupil learning are beginning to change from a technical to a conceptual view, teacher education as a vehicle to increase quality education has become more prominent (Verspoor and Leno, 1986; Rust and Dalin, 1990; UNESCO, 1996; Stigler and Hiebert, 1997; Darling-Hammond, 1998; World Bank, 1998; Day, 1999; Day et al., 1999).

While researchers such as Beeby (1966) wrote several years ago that the quality of education would improve only as teachers’ educational level increased, at the time of educational expansion teachers as a whole were seen mostly as inputs to the system with little attention paid at the process of teaching and at the knowledge teachers needed to have in order to properly teach.

Consequently, teacher education in developing countries evolved in many cases independently from the work and the context where teachers taught and under adopted models or theories originally developed by colonizers. Through the years, a number of approaches have evolved alongside the adopted traditional teacher education programs to address relevant concerns and to solve issues of demand (such as distance education and other in-service teacher education approaches). Although most of these approaches have been created as a response to demands by the population, teachers or teacher unions, it is likely that these approaches may be more relevant to context, simply because they were created ‘in country’ to meet perceived needs. The effects of these approaches, however, are difficult to measure due in part to lack of systematic research.4

Similarly, the concern for increasing quality has prompted a closer look at the processes of schooling. This shift from input–output models to process has brought as a result a better understanding of the complexities involved in teaching and has ‘problematised’ the nature of teacher development. Nevertheless, teacher development approaches world-wide have gone relatively unexplored making the study of variation and similarities within and across countries an important research priority.

A number of issues confronting researchers on teacher development have to do with the standard that should be considered when studying its nature and effects. For example, should current approaches be expected to provide teachers with the knowledge, skills, and attitudes they need to fulfill their role when many programs were only designed to partially fulfill such aims (such as opportunities to conceptually understand the subject matter or to develop pedagogical skills on teachers rather than both)? Should different teacher development approaches be studied and compared when they were designed to address substantially different populations with quite different curricula? When studying teacher development should teaching and its connection with pupil achievement level be evaluated as well? And, if so, how, when and

4 The challenge of research in teacher development is a ‘chicken and the egg’ issue as the lack of systematic data collection at the program and system levels makes it difficult to engage in inquiry that may be used for program improvement and/or accountability purposes. Similarly, it can be argued that data collection should obey a well-organized research plan.
under what conditions? Programs’ goals may be shaped by empirically based normative visions of good teaching, with program’s actions consequently evolving around increasing understandings of the knowledge, dispositions and practice teachers need to be successful in varied schools settings. Other programs may be shaped to respond directly to State mandated guidelines (Stuart and Tattoo, 2000). Thus the program actions may evolve around state-developed standards which may vary along political tendencies and accountability needs of particular educational systems more than on the learning needs of teachers and students. The study of existing teacher development approaches within (and across) a given country makes it possible to appreciate variability as well as similarities in the theories and standards that shape the education of teachers and enrich our understanding of what works in different contexts.

3. Studying teacher development: conceptualizing program attributes, effects and costs in Sri Lanka

Historically, teacher education in Sri Lanka has had to struggle with a colonial educational legacy affecting both the structure of the educational system as well as the content and style of delivery of the instruction given to prospective and experienced but untrained teachers. Since independence from Britain in 1948, teacher education has attempted to respond to the mandates of a centralized administration through transformations that have both preserved old structures and adopted new ones. This dynamic was illustrated by the relatively recent development of Colleges of Education and Distance Education approaches to prepare teachers, while supporting the continuity of the long-standing British established Teacher Colleges. Sri Lanka’s need to develop a modern capitalist society and for national reaffirmation has encouraged close collaboration of teachers with the state and facilitated positive changes through educational reform. The demands to reconcile these needs however have brought contradictions within the system and the exacerbated ethnic conflict. As a socialist democracy, Sri Lanka confronts the dilemma of attending to the interest of the disadvantaged and appease those of the elite, while trying to educate a population that will fill the available positions in the job market. These tensions are reflected in teacher education which confronts the challenges and dilemmas involved in preparing teachers to teach for two extreme conditions, those existing in poor rural schools (which include about 80% of the schools in the country) and those existing in well provided schools including those located in urban areas. In sum, teacher education has attempted to affect teachers’ knowledge and skills, their individual motivations, and status as professionals while maintaining a high level of coherence around the national educational goals and curriculum.

To understand the intentions and design of teacher development in Sri Lanka, it was deemed important to make the program’s conceptual foundations explicit, that is, to uncover the connections and assumptions behind the methods and techniques, as well as the nature and grounds of knowledge adopted by those who are charged with constructing teacher preparation and development programs. This proved to be an involved process, as it required the examination of documents, carrying out interviews with key program personnel, and organizing discussion forums where program personnel were asked about program goals and means to accomplish them. In the case of the Sri Lanka study the author and two Sri Lankan researchers read and carefully analyzed program documents, interviewed individual program personnel, and held three large group discussions with program personnel and educational authorities. Fig. 1 shows the conceptual foundations underlying the actions of teacher development approaches. Although this conceptualization of teacher development was in the ‘participants heads’ and in documents, it had not been made explicit until the time of the study. This general framework helped to construct the research design. The section on program outcomes...
and expectations from graduates in Fig. 1, outline teacher development external standards, which we used to develop our evaluation instruments. Fig. 2 shows the three approaches to teacher development we studied in Sri Lanka. According to this representation, selection and program processes, along with appropriate incentives would produce an effective teacher capable of positively affecting pupil achievement. In this instance, the outcome also reflects internal program standards and — in the case of Sri Lanka’s system of governance — central government standards as well. For the purposes of this article, a short summary of the findings will suffice. For extensive discussion of the findings and their interpretation, the author refers the interested reader to extensive reports of this research which have been published elsewhere (Tatto and Kularatna, 1993; Tatto et al. 1991, 1993; Tatto and Dharmadasa, 1995). Briefly, the Sri Lanka evaluation pointed to four important findings. First, teacher development makes a difference in what the teacher does in the classroom and what the teacher does in the classroom is positively correlated with pupil achievement. Second, teachers who undergo a teacher development program do perform differently from those who do not. While the first are more informed about their subject matter and pedagogy, the later seem to turn to traditional instruction — probably derived from their own personal experience as students — to direct their teaching. Third, in regards to direct measures of teacher preparation, graduates from the Colleges of Education and the Distance Education programs were stronger both in subject matter and pedagogy than those from the Teacher Colleges. Fourth, the Distance Education approach was more cost-effective than the other approaches studied. These findings had important implications for future policy on teacher development as a vehicle to increase the quality of education in Sri...
COLLEGES OF EDUCATION: Opportunity to mold character and attitudes.

Selection of young, well qualified candidates with advanced level pass (A/L).

Incentives: Diploma in Education, Promotions, Salary increase.

Effective teacher with the appropriate knowledge, values, and attitudes. Higher pupil achievement.

Fig. 2. Different approaches of teacher education in Sri Lanka.

TEACHER COLLEGES: Experienced teachers take more advantage of training. Training raises senior teachers’ morale.

Selection of good experienced, senior teachers with either ordinary level (O/L) or advanced level (A/L).

Incentives: "Trained teachers certificate." Promotions, Salary increase.

Effective teacher with the appropriate knowledge of the elementary curriculum and pedagogy. Higher pupil achievement.

DISTANCE EDUCATION: Self-regulated learning. Continuous application and questioning of what is learned in the classroom.

Selection of experienced teachers with O/L or A/L passes.

Incentives: “Trained teachers certificate.” Salary increase, Promotions.

Effective teacher with pedagogical knowledge and subject matter knowledge. Higher pupil achievement.

Lanka as they helped to pinpoint major program features observed to have a positive effect on program success and teaching practice: (a) clearly established standards/strategies for recruiting and selecting excellent qualified teacher candidates; (b) clearly established internal and external standards for graduates of teacher education programs; (c) the use of updated knowledge and teaching techniques that research has proven effective in previous attempts to educate teachers and children; (d) the inclusion of a strong subject matter component in a balanced program allowing teacher learners a good understanding of what they are teaching as well as how to teach it; (e) the frequent interaction between what is being learned and what is applied in the classroom positively affected teaching practice; (f) constant face to face interaction — especially in Distance Education programs — positively affected teaching practice and pupil achievement; (g) the integration of the program’s curricula with the community where the teachers will work had a positive effect on teaching practice; (h) regarding pupil achievement levels, any type of training provided to teachers was better than no training at all; (i) high levels of effectiveness per unit of expenditure had a positive effect on the preparation of teachers.6

6 Much discussion could be included here regarding the different features of the three programs evaluated in Sri Lanka and how these features influence teaching practice and knowledge, again the reader is advised to consult previously published articles containing such information. The emphasis of this article is in spelling out the methodology used for the study, and to contribute toward the development of methodologies for the evaluation of teacher development programs which is rare worldwide. For important ongoing attempts see the research in progress in Ghana, Lesotho, Malawi, South Africa and Trinidad and Tobago, under the project MUSTER of the Centre for International Education at the University of Sussex Institute of Education. An additional purpose is to encourage researchers to
3.1. Studying the program attributes as documented

The evaluation study design called for details regarding how different approaches varied in relation with one another in a particular context, given the needs and resources of that context. Information about program’s history, philosophy, goals, and practices was obtained through interviews with program directors and faculty, as well as from documents provided by them. We conceived the collection of these attributes as the program theory (made explicit in Fig. 2). While it is not possible to include in this article the questionnaires and other research instruments we used during this phase of the study due to space limitations, it is possible, however, to include the matrices we used to construct program profiles which were the basis for developing an analysis of the different approaches to teacher development in the island and provided insights into the how and why of program effectiveness and costs. Table 1 shows the matrix used to guide this analysis.

Table 1: Developing a cross-program profile of different approaches to teacher education

<table>
<thead>
<tr>
<th>Program/goal or standards/philosophy</th>
<th>Duration/location</th>
<th>Entry conditions</th>
<th>Content</th>
<th>Supervised practice and follow-up</th>
<th>Approaches to training</th>
<th>Target population</th>
<th>Incentives to enter teaching</th>
<th>Quality level</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Given the theory of the program we looked at particular factors to define program success or in this case, effectiveness. Understanding program’s goals, program duration and approach, circumstances under which incentives or support were provided, the target program population, the program’s content, and the programs’ costs provided part of those conditions regarded as necessary for success. In addition, the emphasis programs placed on different opportunities for teachers to experience different approaches to knowing and teaching had an important impact on teacher learning. Table 2 shows the matrix we used to analyze these programs’ emphasis on different opportunities to learn for prospective and experienced teachers.

The information obtained through these two matrices was used to define the particular approaches followed by each program and help us refine indicators of program outcomes. The final schematic version is presented above in Fig. 2.

3.2. Studying program effects

The study of program effects involved a number of important decisions to be made, such as deciding what was to count as an effect of the intervention. In the Sri Lankan case we used programs’ internal and external standards to define program effects. We defined program effects both in terms of a general conceptualization of teacher development (outlined in Fig. 1 above) and in terms of the approaches included in the study (outlined in Fig. 2 above). We also defined program effects as the value added of teacher preparation by comparing how teacher learners measured on the knowledge, skills and dispositions the program expected them to achieve at the end of their preparation. These measurements were taken at three different points in time: entry, exit and during classroom teaching. Value added was also determined by comparing teacher graduates with a similar population of teachers who had not received teacher development. In designing our study we followed the steps typi-
Table 2

Developing a cross-program profile of the emphasis areas in teacher education

<table>
<thead>
<tr>
<th>Teacher education approaches:</th>
<th>Program 1</th>
<th>Program 2</th>
<th>Program 3</th>
<th>Program 4, etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>clock hours</td>
<td>clock hours</td>
<td>clock hours</td>
<td>clock hours</td>
</tr>
<tr>
<td>% of total time/modules allocated to the areas of emphasis in each of the approaches</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Areas of emphasis

- Professional Foundations: Psychology, Sociology, Economics, History
- Curricular contents of preschool, primary or secondary education
- General education: subject matter knowledge
- General pedagogy/teaching methods
- Methods and practice of educational research
- Teaching practice
- Co-curricular activities
- Internship
- Examinations
- Methods of instruction

Researchers working collaboratively developed a design that could be carried out in a short period of time while providing relevant information for decision making. We used a cross-sectional design of teacher-learner cohorts at several points in their level of development with a control group of classroom teachers without formal teacher preparation, and compared them on their background, experiences, knowledge, and practices (Cook and Campbell, 1979). See Fig. 3 for a description of the design of the study on a diagrammatic form.

Measuring the knowledge, skills, and attitudes of teacher learners at three points in time (program entry and exit, and in the school classroom) had several advantages. One, it facilitated our understanding of what they bring with them to teacher education. Two, allowed us to infer how much and under what conditions teachers learn. Three, allowed us to infer how much of the training was retained and applied under the pressures of the job.

7 According to programs’ theory and internal/external standards, we defined an effective program as one capable of improving a teacher learner’s mastery of subject matter and teaching skills (on both theoretical and practical level), and capable of promoting the development of professional attitudes — all of which would enable the teacher-learner to structure an environment that will in turn encourage learning and promote pupil achievement. Pupil achievement was thus conceived as the ultimate indicator of program effectiveness.

8 The researchers were from the National Institute of Education in Sri Lanka and from Michigan State University, Harvard University, and IIR in the US. The time frame for this study was limited to a year of fieldwork and a year for preparation of the study, data analysis, and reporting. In addition ethnic conflict in the island at that time threatened to affect the study.
Fig. 3. Study design.

Four, allowed us to observe the trainees’ application of teaching skills in their own classrooms in relation to what children learned. The indicators we measured in the case of knowledge of subject matter, included conceptual and factual understandings of higher level learning as well as the level at which teachers-learners were expected to teach. In the case of pedagogy, we measured skills at a theoretical level through vignettes in a self-administered questionnaire, and at a practical level through classroom observation. Teacher-graduates were rated on their classroom performance using a battery of three observation instruments (classroom resources and use, specific teaching skills, and time distribution in class) consisting of extensive checklists of closed-ended items. Teaching dispositions — toward the teaching profession, about pupils, and about the community surrounding the school — were measured through Likert type scales in a self-administered questionnaire. Conceptual and factual understanding in mathematics and language in pupils was measured using open-ended self-administered, and when necessary researcher-administered tests developed by Sri Lanka experts.

3.3. Selecting appropriate data analysis techniques

We used analysis of covariance across the different programs and cohorts of teachers studied to check for their similarity in relevant background variables and to compare the different outcomes measures (knowledge, skills, attitudes, teaching skills, and time distribution in class). The first observational scale measured the resources existing in the classroom and the use of them by the teacher. The second scale measured specific teaching skills such as the use of recitation, teacher or student centered strategies, observation, question–answer periods, discussion, problem solving, assignments, or story telling methods. The third observational scale measured the time the teacher spent on each one of the stages that constitute a class session (such as presentation of the lesson, guided and independent practice, homework assignment and review). The observers were expected to faithfully record classroom resources, the teachers’ behaviors in a dichotomous format (this is, whether the behavior listed in the observation instrument had or not occurred), and the time spent in the different stages of a formal class session.
practice and pupil achievement). In the analysis of the classroom observation data, we were careful to contextualize the data according to the participants’ background variables and school context. In the analysis of the pupil achievement data, we also took into account pupils’ background, teachers’ background, and school context using multiple regression techniques.15

3.4. Studying program costs

The study of costs in teacher education is not only logistically difficult since in many cases the data is not organized or non-existent but it is also politically complex. In the Sri Lanka study, we assumed that teacher education program’s costs could be measured directly or inferred from budget statements and government documents. Given the uncertainty regarding information reliability in program documents however, we disregarded government and program documents and instead followed Tsang’s (1988) strategy, and measured costs using the direct approach consulting both program administrators and participants as the source of information. We identified the costs to include in this measurement using the ‘ingredients approach’ suggested by Levin (1983). Accordingly, we identified costs to the institution, to the individuals or private costs, and capital costs. Institutional costs included both recurrent (salaries and benefits for instructors, administrators and support staff, utilities and communications, maintenance of buildings and equipment, supplies and equipment, books and publications, staff training, transportation, medical/welfare services, teacher learner allowances/salary maintenance), and capital (buildings/land, furniture/equipment), as well as private costs (facilities or registration fees, books and supplies, transportation, health, room and board, teacher learner activities, teaching materials, personal expenses, and foregone income).

Two questionnaires were developed from scratch. One for institutional costs and the other for private or teacher learner costs. We administered the institutional cost questionnaire to senior project staff during interviews with key college administrators at the different institutions included in the study. We were only interested in cost information for the academic year in which teacher learners had graduated. We administered the teacher questionnaire to those who had just completed their preparation in the programs studied. They were asked to record their personal costs and allowances for the years during which they were enrolled in their program.

Since we studied the entire graduating class for the study period across the three different approaches, there was a good degree of certainty that the individuals surveyed provided a reliable picture of the costs they incurred for their education. The data collected correctly reflected the differential patterns of financing by the state and the individual teachers. For example for the distance education graduates our cost figure showed that the teachers themselves financed most of their education while the costs to the institution and costs of capital were minimal. For the other two programs — which were subsidized by the state — the private costs were quite reduced (and in one program the teachers made money while in training!) while the institutional and capital costs were quite high. In the absence of more solid, long-term data, we believe that our direct approach asking both teachers and administrators about costs gave us both a reliable and effective source of information.

4. Conceptualizing unobtrusive approaches to the study of teacher development in Mexico

Since the years after the end of the Mexican Revolution (1921) teacher development has been seen by the Mexican state as a means to socialize its teaching force and this objective has been just as important as the quality of the education teachers receive.16 The major institution that educates

15 We were aware that we also should have collected data of pupil’s past performance, but this data was not readily available at the time of the study. For an excellent discussion of the importance of including these indicators see Mullens et al. (1996).

16 The government of President Calles, which began in 1924, followed a strictly modernist and efficient tendency and emphasized and extended the presence of ‘action schools’ in
teachers (La Normal de Maestros) has traditionally placed more emphasis on the centrally sanctioned curriculum, pedagogy, and purposes of education than in other areas strongly linked with high quality teaching such as in depth knowledge of subject matter, knowledge of pupils and of the community where teachers will work (Schmelkes, 1997; Putnam and Borko, 2000). The central role of the state in the conceptualization, development, and implementation of teacher education in Mexico and the lack of empirically developed standards for the teaching profession in general and for teacher development in particular, has made it difficult for institutions outside of the government to initiate evaluation studies of teacher development. Thus teacher development programs have been allowed to create their own internal and even external accountability strategies while still regulated by the central government (World Bank, 1991; Secretaria de Educacion Publica., 1991, 1992; Farres and Noriega, 1993; Palafox et al., 1994).

One of the major challenges in the study of the effects and costs of teacher education in general, is the lack of reliable longitudinal data (Tatto, 2001). The proposal of an empirical study of teacher education in Mexico practically meant collecting data from scratch. In any context, financing research on teacher education may be an expensive proposition and in settings where resources are limited by politics or other reasons, research is not always the first priority of policy makers. Given that these constraints were present in the Mexican case, it was necessary to examine alternative methods to study teacher development that could at the same time provide relevant information aimed at improving educational quality through teacher development.

In initiating the study of teacher development in Mexico, the author had access to sources of reliable information regarding different features of teacher development approaches, to program coordinators and faculty, and to participant teachers, but the possibilities for a larger empirical study with government support were non-existent. The data collection on effectiveness and costs was limited to few key interviews and document analysis. Nevertheless, the documentation around teacher education is relevant in understanding its reach and possibilities for impact.

4.1. Describing teacher development program variation

In this study description of program variation was considered a valuable source of insight regarding the theory, nature, and possibilities of teacher development. Descriptions of program variation in Mexico were developed according to the concepts outlined in Tables 1 and 2 in the previous section. Depending on the quality of program documentation, program descriptions can be relatively inexpensive and shed light on the knowledge gaps regarding our understanding of the different characteristics and the potential impact of teacher development in a particular context. In Mexico as in Sri Lanka, the author used program description as background for examining potential sources of program effectiveness and to uncover programs’ theories and standards. Accordingly, the characteristics of the programs were determined through a review of official documents and through interviews with selected program managers and their faculty members to uncover the features of the programs as they were understood and implemented. Understanding program variation made it possible to provide plausible explanations regarding the differential impact of teacher development on teachers’ knowledge and skills, and classroom performance. Description of program variation also made it possible to suggest strategies for improvement, and to identify those areas where the different programs studied may be strong, allowing for the possibility of creating hybrid forms to teacher...
development. As in the section on the Sri Lanka research above, the objective of this section is to outline the methodology used in the Mexican study (the results of this study are extensively discussed in Tatro, 1997a,b,c.d, 1999a,b).

In Mexico the research objective was limited to examining the underlying assumptions and current expectations of teacher development at a national level, and to identify the gaps in existing knowledge recognizing the areas where future research might be beneficial. Using the methodology developed in the Sri Lanka study as a point of departure, the Mexican research included an analysis of five salient approaches to teacher development in Mexico. Table 3 shows the results of the analysis. This framework calls for analysis of characteristics such as the program’s entry conditions and target population under the assumption that controlling these areas may contribute to the ease with which teachers will acquire the knowledge base required, and the program’s degrees of freedom regarding offerings. For instance, if one of the entry conditions in pre-service programs is that teachers come to the program with a demonstrated level of mastery of the subject matter, the teacher education program may place less emphasis on such area. Similarly, if the program is targeted to teachers who have emerged from the community in which they will eventually teach, the program may place less emphasis on developing strategies to help teachers acquire knowledge of the context and pupils, and may instead attempt to help teachers incorporate that knowledge in the understanding and enactment of their practice. Additional factors included in the framework were perceived or real incentives for undergoing teacher education, the recognized quality of a specific program, and the program’s costs. These factors were considered to influence the level of commitment of teachers, the teacher educators, and the extent to which the program may be able to achieve its aims.

An additional framework for analysis was developed by consulting the increasingly large research literature documenting what counts as good teaching. According to this literature, good teaching involves a complex mixture of knowledge of subject matter, general pedagogical knowledge (principles and strategies of classroom management and organization), curricular knowledge (educational materials and programs), pedagogical content knowledge (teacher’s professional understanding that brings together subject matter knowledge and pedagogy), abilities to teach diverse learners, knowledge and understanding of the context where teaching occurs (including group and classroom dynamics, governance and financing of schools and the school system, and the character of communities and cultures), as well as knowledge of educational ends, purposes and values. This mixture of knowledge categories is known as the knowledge base of teaching (Shulman, 1987).

Having as a point of reference these categories, the work of teacher education becomes the extent to which different approaches provide teachers with the needed knowledge base. And this knowledge base becomes the standard of quality against which teacher education approaches can be measured. Table 4 shows an additional matrix developed to do an analysis of programs’ possible sources of impact on the base knowledge of teachers.

Further, program documents were analyzed looking for evidence of characteristics that according to the emergent literature on high quality teacher development may increase teachers’ opportunities to learn (National Center for Research on Teacher Learning, 1991; McDermid, 1993; Tatro, 1996, 1997d). The results of this analysis are shown in Table 5 below. The study called for analysis of agreement among program goals and philosophy as an important indicator of program coherence. The analysis also documented whether there was evidence of a comprehensive program strategy to provide instruction relevant to the context where teachers will teach. In addition, it was considered important to understand the balance between institutional and field components and whether there were meaningful connections between the program and schools and teachers such as opportunities for tutoring, supervision and follow-up. Longer programs, with a combination of institutional and field components with tutoring, supervision or follow-up, and high quality self-paced materials, for instance, may have the best chance to help teachers gain the type of knowledge seen as necessary to prepare good teachers. Similarly, developing a grounded knowledge of pupils and the social and
Table 3

<table>
<thead>
<tr>
<th>Program/goal/philosophy</th>
<th>Duration/ location</th>
<th>Entry conditions</th>
<th>Content</th>
<th>Supervised practice &amp; follow-up</th>
<th>Approaches to training</th>
<th>Target population</th>
<th>Incentives to enter teaching</th>
<th>Quality level</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal de Maestros (basics &amp; superiores):</td>
<td>Full time</td>
<td>No recruitment or selection but candidates prevent an entrance exam.</td>
<td>Traditional with emphasis on educational foundations, and pedagogy. After 1984 includes the teaching of subjects taught at the university level but disconnected with the daily lives of schools. The new curriculum attempts to depart from the traditional lecture method to a more participative one encouraging critical thinking.</td>
<td>Limited, poorly coordinated and traditional. Teachers are left to &quot;sink or swim&quot; during this experience. Lack of contact between faculty from Normales and practicing school teachers.</td>
<td>Teacher-centered, lecture format. After 1984 there is an attempt at creating a participatory learning environment for prospective teachers.</td>
<td>After 1984 high school graduates; before then secondary school graduates.</td>
<td>A secured position in a State school backed by the teachers union.</td>
<td>Nationally recognized as providing low quality instruction.</td>
<td>Moderately high: Considering the recognized low quality of instruction and the low teacher student ratio of 9:1.</td>
</tr>
<tr>
<td>Universidad Pedagogica Nacional:</td>
<td>Duration:</td>
<td>Recruitment or admission exam. Low standards of admission in contrast with universities.</td>
<td>Includes the teaching of subjects taught at the university level but disconnected with pedagogy.</td>
<td>Non-existent. There are few or no formal connections with schools.</td>
<td>Teacher-centered, lecture format; attempts at developing a &quot;university like culture.&quot;</td>
<td>Graduates Normales. Individuals with or without teaching experience.</td>
<td>Grants a BA degree. Few go into or back to teaching.</td>
<td>Low quality criteria with curriculum distanced from teaching.</td>
<td>High. Very low student-teacher ratio.</td>
</tr>
<tr>
<td>CAM's</td>
<td>Not clear.</td>
<td>Teachers who did not graduate or receive formal initial teacher training.</td>
<td>Traditional with emphasis on educational foundations, and pedagogy. Similar to those provided by Normales. Plan updating on curricular and instructional plans originated by the reforms.</td>
<td>Not clear.</td>
<td>Teacher-centered, lecture format, and self-learning, self-paced materials.</td>
<td>In-service teachers who need to obtain a teaching credential or who need to update their knowledge.</td>
<td>Since these teachers are currently in-service, the incentive is to obtain a teaching credential.</td>
<td>Recognized as of low quality.</td>
<td>Not clear.</td>
</tr>
</tbody>
</table>

(continued on next page)
<table>
<thead>
<tr>
<th>Program/goal/philosophy</th>
<th>Duration/location</th>
<th>Entry conditions</th>
<th>Content</th>
<th>Supervised practice &amp; follow-up</th>
<th>Approaches to training</th>
<th>Target population</th>
<th>Incentives to enter teaching</th>
<th>Quality level</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programa Emergente de Actualización de Maestros (PEAM): Actualization &amp; upgrading to pre-school, elementary, and secondary teachers, their principals, and their supervisors. Attempts to strengthen in the short term the knowledge of teachers, principals, and supervisors, to support the process of decentralization and modernization at the state level, and to consolidate a national framework for long-term teacher upgrading.</td>
<td>Intensive phase: Short periods varying from 2 weeks to 1 month throughout 2 years (?)</td>
<td>None. Attempts to reach all teachers in the country. Teachers are asked to participate on a voluntary basis during the intensive phase.</td>
<td>Curriculum that departs from the traditional oriented to encourage problem solving in pupils. The intensive stage presents information on the National Agreement on the Modernization Process, updates on the curricular and program changes, and in the contents of the new textbooks for elementary and secondary grades. Includes materials for multigrade teachers. Resorts to Technical School Councils, and Principal and Supervisor’s support for successful implementation. The extensive stage presents strategies for promoting school change, and collaborative work among school personnel. Not clear provision for self-sustained learning.</td>
<td>Not clear whether program instructors actually observe &amp; provide feedback to teachers in their classrooms. Carefully designed self-instructional materials; on-the-job-training; group activities; within a modernization philosophy and a de concentration framework. Attempts to give full coverage to all the teachers in the country. Also includes the training of school principals and supervisors to train teachers. Supported by the current Carrera Magisterial in which teachers obtain “points” per course passed which eventually translates in salary increases and/or promotions.</td>
<td>Varies depending on context. Lack of coordination and follow up between the state level and the center after the 1st year of activities.</td>
<td>High: National scale. State support under the Modernization Program and the decentralization reform.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 3 (continued)

<table>
<thead>
<tr>
<th>Program/goal/philosophy</th>
<th>Duration/ location</th>
<th>Entry conditions</th>
<th>Content</th>
<th>Supervised practice &amp; follow-up</th>
<th>Approaches to training</th>
<th>Target population</th>
<th>Incentives to improve quality</th>
<th>Quality level</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>PARE: Actualization &amp; upgrading. Began in 1992, this is a compensatory program that attempts to give a new impulse to those schools or populations who are at risk of being left behind in the modernization process by providing additional resources and services. The program represents an integrated conception to teacher and school improvement which aims to, in addition to providing training and incentives to teachers, support principals and supervisors’ development, provide texts, educational spaces, and teaching materials among others.</td>
<td>Short periods depending on the number of modules included in the training program. In-site, school based</td>
<td>Selected by the state SEP in conjunction with the sponsoring/ supervisory agency CONAFE</td>
<td>Innovative curriculum based on current research on education and teaching; co-curricular activities; teaching methods &amp; some subject-matter emphasis. Includes materials for multigrade teachers. Looks to be relevant to teachers and teaching in rural areas.</td>
<td>Not clear whether program instructors actually observe &amp; provide feedback to teachers in their classrooms. The guide provided to the instructors do recommends that instructors “schedule with teachers follow-up visits and technical advisory meetings [...] to verify that change in the teaching practice has occurred.”</td>
<td>Carefully designed instructional materials in modules; on-the-job training; group activities; with a pupil-centered philosophy; problem solving, conceptual approach to pupil learning</td>
<td>Teachers and administrative personnel (principals and supervisors) who work in schools located in poor or rural areas. Also a course for teacher educators</td>
<td>Supported by the current Carrera Maestrias. Possibilities for improved work conditions. Other incentives such as increased salaries.</td>
<td>Varies depending on context. Overall good coordination follow-up and cohesion across sites.</td>
<td>Moderate: Moderate scale. State support with a loan from the World Bank.</td>
</tr>
</tbody>
</table>
Table 3 (continued)

<table>
<thead>
<tr>
<th>Program/goal/philosophy</th>
<th>Duration/ location</th>
<th>Entry conditions</th>
<th>Content</th>
<th>Supervised practice &amp; follow-up</th>
<th>Approaches to training</th>
<th>Target population</th>
<th>Incentives to enter teaching</th>
<th>Quality level</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEE (private and local state support):</td>
<td>Two-years or four</td>
<td>Selected the teachers participating in the Rural and Community Education Project. Selection by CEE along with the state SEP. Teachers participated on a voluntary basis. Pre-school and primary school teachers.</td>
<td>Innovative curriculum based on the idea of teachers as reflective practitioners and on teacher learning as a self-initiated, self-sustained activity. Curriculum emphasizes theoretical teaching foundations, curricular innovations in rural basic education, and practice and methods of participative research. Emphasis on teachers working in cohorts within schools.</td>
<td>Not clear whether program instructors actually observe &amp; provide feedback to teachers in their classrooms but the program seems organized so that teachers provide feedback to each other.</td>
<td>Careful design and development of curriculum within schools and a sense of ownership/empowerment to teachers. Teachers spend half of the program in contact with the instructors, and half in individualized or independent study.</td>
<td>Small scale limited to a small group of teachers who work in schools selected by the Rural and Community Education Project. Development of collegiality within schools.</td>
<td>Good. With eighty percent success rate. Carefully controlled and monitored.</td>
<td>Low/small scale. State SIP and private support.</td>
<td></td>
</tr>
</tbody>
</table>
Table 4
Possible impact on the base knowledge of teachers of the five approaches to teacher education in Mexico (positive impact; no evident impact; source: Tatto, 1997a)

<table>
<thead>
<tr>
<th>Teacher education approaches:</th>
<th>Normal de maestros</th>
<th>Universidad pedagogica nacional</th>
<th>PEAM IP= intensive phase</th>
<th>PARE EP= extensive phase</th>
<th>CEE/SECyR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge base of teachers:</td>
<td>Possible impact of different teacher education approaches in Mexico on the knowledge base of teachers:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subject matter knowledge</td>
<td>–</td>
<td>–</td>
<td>IP=</td>
<td>EP+=</td>
<td>+?</td>
</tr>
<tr>
<td>General pedagogical knowledge</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Pedagogical content knowledge</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>+</td>
<td>–</td>
</tr>
<tr>
<td>Knowledge of learners</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>+</td>
</tr>
<tr>
<td>Knowledge of context</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Knowledge of educational ends, purposes and values</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

Cultural context where teachers will teach may be facilitated by arrangements that include field components and strong and meaningful connections with schools and sound mentoring by experienced teachers (Zeichner and Tabachnick, 1981; Shulman, 1987; National Center for Research on Teacher Learning, 1991; Tatto, 1997a,b,c; Tom, 1997).

The analysis also documented the quality of the materials provided to teachers to learn the content to be taught under the assumptions that curriculum knowledge may be more dependent upon the type, quality and accessibility of the materials than on the type, length, location, approaches to training, or program’s entry conditions. Similarly, under the assumption that teacher educators need to be able to know, understand, and practice the ambitious goals set for teachers, the analysis documented whether programs had provisions for the preparation of teacher educators to deal with the complexities of teaching and the development of new materials and trends in the field. A similar assumption was made regarding the preparation of administrators and other teachers in schools, consequently the analysis sought evidence of organized within-school improvement efforts.

Congruent with current recent research on cognition, the analysis sought evidence of whether teacher preparation programs in Mexico made ‘connections’ between the subject matter and pedagogical content knowledge and curricular knowledge (Putnam and Borko, 1997, 2000). And whether the current structure of the curriculum seems to be conducive to supporting the critical thinking and problem solving approaches to learning along the lines proposed by recent educational reforms.

In sum, the strategy of analysis followed in the Mexico study allowed the development of a dynamic cross-program analysis of teacher education approaches, the uncovering of program theory as documented, the identification of gaps in program knowledge, implementation and expected effects, and the development of tentative policy recommendations (Tatto, 1997d). Although the teacher education study in Mexico provided valuable insights in beginning to understand the aims and potential of teacher development, it is still necessary to test this potential in the field. Ongoing attempts in Mexico’s educational system seem to be moving in this direction.17

17 It is important to note here that Mexico’s educational system has a very sophisticated system of collecting and evaluating educational statistics at all levels of the system. Mexico also counts with a highly qualified group of educators contributing to the design and implementation of the ongoing educational reform. Thus the lack of evaluation efforts in the area of teacher education...
### Table 5

Different characteristics that may increase the impact of teacher education in Mexico (+ positive impact; − no evident impact; source: Tato, 1997a)

<table>
<thead>
<tr>
<th>Teacher education approaches:</th>
<th>Normal de maestros</th>
<th>Universidad pedagogica n_al.</th>
<th>PEAM IP=intensive phase</th>
<th>PARE EP=extensive phase</th>
<th>CEE/SECyr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Characteristics:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coherence between stated goals and program actions</td>
<td>−</td>
<td>−</td>
<td>IP+ EP−</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Comprehensive strategy</td>
<td>−</td>
<td>−</td>
<td>+?</td>
<td>+</td>
<td>−?</td>
</tr>
<tr>
<td>Relevance to context</td>
<td>−</td>
<td>−</td>
<td>?</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Balance of institutional and field components</td>
<td>−</td>
<td>−</td>
<td>IP− EP+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Meaningful connections with schools and teachers</td>
<td>−</td>
<td>−</td>
<td>IP? EP+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Tutoring, supervision or follow-up</td>
<td>−</td>
<td>−</td>
<td>IP− EP?</td>
<td>+?</td>
<td>+?</td>
</tr>
<tr>
<td>On-the-job training and field based programs</td>
<td>−</td>
<td>?</td>
<td>IP− EP+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Good quality self-paced materials</td>
<td>−</td>
<td>?</td>
<td>+</td>
<td>+</td>
<td>−</td>
</tr>
<tr>
<td>Preparation of teachers and school administrators</td>
<td>−</td>
<td>−</td>
<td>IP+ EP+</td>
<td>+</td>
<td>−</td>
</tr>
<tr>
<td>Preparation of teacher educators</td>
<td>−</td>
<td>−</td>
<td>−</td>
<td>+</td>
<td>−</td>
</tr>
<tr>
<td>Innovative curriculum: problem solving/conceptual approach</td>
<td>−</td>
<td>−</td>
<td>IP− EP+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Organized within school improvement efforts (e.g. through technical councils)</td>
<td>−</td>
<td>−</td>
<td>IP? EP+</td>
<td>+</td>
<td>?</td>
</tr>
</tbody>
</table>

### 5. Discussion and implications

The approach to measuring costs and effectiveness in Sri Lanka is an example of a study on teacher development that has been difficult to replicate in other contexts, thus a discussion about the conditions that supported this study is important here. A number of conditions were present in Sri Lanka that supported this study such as internal and external financial support, state and local inter-

development is not due to lack of capacity or ability it is due mostly to the political nature of such results and its unpredictable consequences among the more than half a million basic education unionized teachers in the country.
unstable political condition in Sri Lanka at the time of the study made it necessary for us to use a quasi-longitudinal as opposed to a true longitudinal research design. It was also necessary to reduce the sample breadth and size. We attempted to deal with this by stratifying the sample for representativeness and by contextualizing the findings using respondents’ background characteristics attempting to reduce the chance that some of the differences between groups were the result of historical factors, or self-selection rather than program effects. While the study could have been more rigorous (e.g. a true longitudinal study, a national-level sample) it provided with a strong model to develop a longitudinal study over the years. By understanding the theory and standards of teacher development in the country and constructing a methodology to test it, the study developed important research capacity for future studies. Indeed this study taught us that teacher development evaluation needs to be seen as a process of professional and institutional growth.

In Mexico a more modest result was achieved as research priorities at the time lay elsewhere. The lessons learned from the limited government support received to study teacher development in Mexico, however, are very valuable indeed. The approach to this study shows how positive, initial steps, can be taken to uncover important areas for future study. The costs of the study in Mexico were small compared with those in Sri Lanka, which made it feasible and accessible. The study avoided controversy in a politically charged arena by analyzing what is public knowledge (program documents and curriculum) and carried out a modest needs detection study by clarifying information and expectations via interviews, observations and focus groups. In this sense the study can also be seen as a consciousness raising exercise, a preliminary laying out of the conditions before engaging in a larger research enterprise. More specifically at the program level, the study sought to provide information regarding program performance according to internal expectations. It also helped situate teacher development approaches in Mexico within a larger international context by using as a framework for analysis based on external and internationally recognized norms of good teacher preparation.

As per the insights gained from the studies done in Mexico and Sri Lanka, the following principles of procedure may be considered in designing empirical studies on the characteristics, effects and costs of teacher development:

- Begin with a collaboratively developed conceptualization of the teacher education program or programs to be studied.
- Develop a document-grounded description of the approaches regarding origins and evolution within and across countries, including measures of process, impact on classroom teacher performance, pupil’s achievement and costs.
- Include questions regarding the degree to which these approaches affect the knowledge base of teachers and prepares them for current demands relative to the context where they will teach.
- Include questions about the value added of teacher education vis-a-vis other interventions or routes to professional development and according to program expectations.
- Include questions regarding the political aspect of teacher education and the political lives of teachers (Ginsburg et al., 1992; Ginsburg and Lindsay, 1995).
- Include external standards of excellence in teacher education.
- Include questions regarding costs as related to program effectiveness.
- Consider the primacy of the context.18
- Secure full cooperation from research recipients. Study participants should include teacher educators and teachers as researchers and users of

---

18 The Sri Lanka and the Mexico’s study can be seen as distinct models for evaluating teacher development. Generalization issues need to be seriously considered for contexts other than Sri Lanka and Mexico. The research approach used in Sri Lanka was designed to be responsive to a centralized policy context undergoing vigorous educational reform; and the study in Mexico was developed to respond to the need for policy relevant information at a time when field-based large scale empirical research was not possible. In the Mexican case therefore an alternative was developed to both preserve the soundness of the research and its use for program personnel and policy makers.
the study. A capacity development component needs to be considered when approaching the evaluation of teacher development.

The main point of this article was to discuss the effects of different methodological approaches within different contexts in the difficult and insufficiently researched area of teacher development. The article makes evident the need to develop sound evaluation research methodologies responsive to teacher development approaches in order to capture their richness and to be sensitive and responsive to the policy demands that emerge from the settings where they are embedded.

6. Uncited references

Ramirez and Meyer (1980) and Tatoo and Velez (1997)

References


Ginsburg, M., Lindsay, B. (Eds.), 1995. The Political Dimension in Teacher Education: Comparative Perspectives on Policy Formation, Socialization and Society. Falmer Press, Bristol, PA.


Schmelkes, S., 1997. La calidad en la educacion primaria. Un estudio de caso. Mexico, DF, SEP-FCE.

Secretaria de Educacion Publica, 1991. La Evaluacion en las Instituciones que Forman y Actualizan Docentes: La experiencia de las escuelas normales. Consejo Nacional Consultivo de Educacion Normal, October, Mexico, DF.

Secretaria de Educacion Publica, 1992. Informe del Seguimiento de las fases preparatoria e intensiva del programa emergente de actualizacion del maestro. Coordinacion Nacional del Programa Emergente de Actualizacion del Maestro, October, Mexico, DF.


