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> > Translation

The key question in this report is the following: Given the current state of knowledge and the experience of over a decade of teacher training reform in North America, how can we design and implement, in education faculties and/or departments, pre-service teacher training programs that are fully appropriate to the needs and realities of today's classroom training, and therefore that reflect the roles and competencies required today of teaching practitioners at the elementary and secondary levels?

To answer that question, our group of researchers focused on a multidisciplinary angle, including the latest research in the various scientific disciplines that have in recent years addressed the issue of teacher training programs. Methodologically, the report takes into account four fundamental dimensions of the curriculum, highlighted by research: 1. the institutional environment and program resources; 2. program content and the underlying epistemological concepts; 3. training systems and processes; 4. and finally, expected competencies and program evaluation. For each dimension, our research and review of official literature allows us to present convincing findings on what we know today about creating, implementing and managing effective pre-service teacher training programs. We have also taken the opportunity to highlight certain themes and issues that we feel ought to be studied in greater depth.

#### 1. The institutional environment and curriculum resources

During the 1990s, pre-service teacher training reforms led to substantial change within teacher training institutions, as well as within schools, where an increasing proportion of practical training now takes place. These changes have had an impact on university and school personnel, including their workload, their career prospects and in some cases their professional identity. What lessons can be drawn from these reforms and changes in the institutional environment and the supporting resources (financial, human and other) that underlie pre-service teacher training? Here are a few areas that deserve scrutiny:

## (A) Learning to negotiate and manage reforms

From the point of view of both stakeholders (university staff, teachers, etc.) and institutions (faculties of education, schools, etc.) who are called upon to implement reforms concretely in the field, the reform process is a major challenge due, on the one hand, to the wide scope of the measures taken, and on the other, to the limited resources that are usually made available to implement them. It should be noted that the last decade has seen not only pre-service reforms, but also budget cutbacks, which means that reformers have not always had the means to carry out their ambitions. But funding is not the only problem. The timing of reform implementation is also crucial. For many stakeholders, it is clear that reforms have often been implemented too quickly. We would need to determine the exact scope of these problems and to harmonize to the extent possible the logic of reform with the resources available on the one hand and the capacity of stakeholders on the ground on the other. We believe that reforms ought to be negotiated and managed in a partnership with stakeholders and institutions called upon to implement them. They should also be piloted, even tried out in smaller units (such as one university together with a few schools), so that any difficulties encountered in implementation can be observed and their consequences assessed in a concrete setting. Finally, we reaffirm the recommendation contained in our previous report to CMEC (Tardif et al, 1998), i.e., the creation of "observation posts" in various parts of Canada, with a watching brief on reforms.

#### (B) Rethinking career paths in relation to practical training and university/school partnerships

One of the key objectives of reforms involves the creation of fruitful partnerships between faculties of education and schools, and between university trainers and teachers. Unfortunately, these partnerships have been implemented up to now without a precise knowledge of the changes they are causing in the practices and careers of both trainers and teachers. Practical training has become longer, more involved and more complex and has been simply superimposed on the existing tasks of stakeholders, without any change in the nature and the orientation of their other tasks, functions and mandates. We believe that two potential solutions deserve further examination:

- The first area of investigation would involve recognizing that a substantial part of practical training has been transferred for good to the classroom, and recommending official recognition of the diversification of roles and careers of teachers in school settings. In practice, this would mean that part of the teaching profession would obtain a new status based on the involvement of certain teachers in practical training. This status would formalize the commitment by experienced teachers of part of their career to training student teachers. This measure would also create the possibility of diversified career paths (currently non-existent) as well as promotion mechanisms for the best teachers and those most involved in the quality of renewal of their own profession.
- In addition, is it really necessary for every faculty of education to take on pre-service training in every category of teaching and school staff? Must every faculty cover every type of research? We would suggest that a certain specialization and differentiation be introduced between faculties of education as well as between the various categories of personnel to be trained (e.g., pre-school, elementary, secondary, specialist teachers, physical education teachers, administrators, etc.), and research areas. Such differentiation would require a recognition of certain forms of research particularly relevant in pre-service training (such as action research, collaborative research, etc) in career paths and promotion criteria for university staff. It would also require support for non-traditional pre-service training programs focusing on co-op studies, the development of skills in reflection, etc. Finally, such a proposal would require that the practical training work of university faculty members be recognized for what it is worth and become a formal career path in the university setting.

#### (C) University faculty and pre-service training involvement

In every pre-service training reform project, university trainers play a key role. But who are they? What are their beliefs and their actual practices in terms of training? Are they taking ownership of reforms and to what extent are they ready to support them?

Oddly enough, that question is difficult to answer, since university trainers rarely make themselves the object of their own research or even the subject of a detailed discourse about their own presentations and practices. All researchers agree that university trainers are a little-known group, but one that plays a key role in the proper implementation of reforms. It should be noted, for example, that even with all the reforms of the last decade, the make-up of education faculties does not appear to have changed, nor have the divisions and differentiations within those faculties between disciplines, fields, functions, or statutes, etc. Reforms do not appear either to have brought about any real change in trainers' pedagogical beliefs and practices; they continue teaching as before, the way they learned to teach when they themselves were university students. In short, and using an analogy, we might say that pre-service reforms have shaken up the institutional broth but without changing the basic ingredients nor the recipe itself.

We therefore believe that it is important to recommend the implementation of research programs focusing on university pre-service trainers, in order to challenge their representations, their practices and the nature of their involvement in the reform process.

# 2. Curriculum content and concepts of curriculum

This dimension leads to the general issue of what to teach in pre-service training and how to teach it. This is of course a key question since the answer defines the content and basic notional organization of the foundation of professional training for future teachers.

### 2.1 - The epistemological foundation of teacher training

A curriculum is not the sum of disparate content elements. On the contrary, these are evaluated, selected, defined and structured into a program that has a certain degree of internal consistency and organization articulated around "epistemological notions" of pre-service training. Those notions define the nature of pre-service training and offer various visions of the core knowledge, that teachers must possess and the way they must learn it. In other words, these concepts of curriculum define what future teachers must learn and know in order to teach and in what way they must learn and know it, etc. It flows from this that an effective pre-service curriculum policy cannot simply add on to or reorganize existing curriculum content, but must also rethink the epistemological foundation of the proposed training program.

However, and in spite of the trend to professionalization evident in the reforms of the 90s, preservice training is still dominated by a world view in which "the academic disciplines are the focus of the curriculum" (Goodlad and Su, 1992, p. 698). Indeed, pre-service training is still dominated by a multidisciplinary epistemological scheme based on departmental silos and fragmentation, and often on the linearity of the content and practice, both in terms of curriculum organization (although more time has been made available for practice-teaching) and in terms of the presentation of the curriculum by teachers in the classroom. In practice, this means that pre-service training is organized around a model in which universities dispense theoretical knowledge, methods and skills, while schools provide settings to apply that knowledge, and it is up to future teachers to integrate those elements. But it need not be that way. The research done over the past few years offers promising alternatives to the existing models:

#### (A) Abandoning the training model based on disciplines

At an epistemological level, we must first separate pre-service training from its reliance on the structures of the discipline. We wish to stress that this in no way means consigning disciplines to the dustbin of history, but rather putting them in their appropriate place within teacher training. Indeed, the disciplines contribute to training in two areas, both of which need rethinking.

- The disciplines can be taught as foundation courses for the teaching of school subjects (language of instruction, history, geography, mathematics, etc.). Unfortunately, those disciplines are usually taught without any alteration for teaching purposes or any link with the curriculum that future teachers will have to teach. In other words, university faculties in each discipline continue to train future teachers exactly the way they train their own students. The contribution of those disciplines must be rethought and they must henceforth be considered as objects of learning, to be apprehended didactically with a view to teaching. There should also be research into the teachability of the curriculum.
- Within pre-service training, various disciplines within the science of education (the psychology of learning, the sociology of education, etc.) were supposed to bring theoretical, cultural and critical contributions to the knowledge of teaching and, more generally, of education. Once again, unfortunately, those disciplines are often still taught without relationship to practice, or even to the school system. We therefore need to rethink the contribution of those disciplines based on their ability to provide future teachers with tools in the form of theoretical, cultural and critical knowledge that would be truly useful to them in classroom situations.

## (B) From knowledge of the discipline to competencies

We need to produce today a pre-service curriculum based on the logic of the professional act, breaking with the "traditional split of disciplines in three teaching blocks: general and scientific, technological and practice" (Raisky, 1993 p. 119). In other words, the centre of gravity of the curriculum must be the professional act itself, both as an object of knowledge and as a training practice as well as a focus of theoretical, cultural and critical reflection. The competency-based pre-service approach, as currently implemented in Quebec and in several countries, holds promise in that respect. In that scheme, competency "involves the ability to mobilize knowledge in the context of the professional act, and is translated into successful, efficient, effective and reproducible practical knowledge, related to a purposive practice or constituting a project in and of itself" (MEQ, 2001, p. 25). In that sense, defining pre-service training in terms of competencies rather than the content of the discipline, is tantamount to rethinking pre-service training based on "the specific professional acts involved in the work of teaching, rather than the various elements of knowledge (subject matter, didactic, or pedagogic) that underlie such competencies, recognizing of course the essential nature of those elements" (*Ibid.*, p. 25). This leads inevitably to "clinical" training regimes designed to facilitate the acquisition of the required competencies by each student.

#### (C) Drawing on students' knowledge

Most current pre-service programs focus on the transmission of declarative knowledge about teaching. Most of the trainers have specialized knowledge they deem to be important and wish to transmit to their students, but without taking into account students' notions about teaching. However, there is considerable literature to show that these notions are not modified by the simple addition of new knowledge. On the contrary, such notions must be taken directly as the object of a process of elucidation and reconstruction. In that sense, the most promising alternative programs appear to be those based on a constructivist model of the learning of teaching, in which students' pre-existing notions are the starting point for a process of negotiating a satisfactory role within a broader vision of good practice. Learning to teach, in that model, is equivalent to learning to deal with one's own conceptions in relation to the expectations of university, school and society. In short, learning about teaching must necessarily take into account the subjectivity of future teachers.

#### 2.2 The need for new curriculum content related to current societal changes

The knowledge base involved in teachers' pre-service program must also take into account societal transformations with Canadian culture, related to the emergence of the knowledge-based society and the new economy based on information and communication technologies (ICTs). Pre-service must also integrate knowledge and competencies concerned with unavoidable socio-cultural realities such as multiculturalism and teaching in minority settings.

#### (A) ICTs

All universities are mandated to prepare future teachers for the challenges of the third millennium, and are also called upon to promote the routine ongoing integration of ICTs in teacher training. Universities, and especially teacher trainers, should therefore play a major social role as models or sources of innovation. However, the opposite situation often prevails in terms of technology integration. Many studies (see Karsenti and Larose, 2001) show, among other findings, that while new teachers have certain elements of knowledge about ICTs, they have few or no practical skills allowing them to integrate ICTs into their professional practice. Haughey (2000, p. 121) agrees with these findings and adds that until very recently, education was mostly concerned about "learning about technologies rather than working with technologies as part of learning experiences." According to Haughey, it is imperative that ICTs be considered not as an extension of the traditional classroom, but rather as a tool to promote the use of learning strategies, especially as part of a constructivist-type epistemological perspective.

To ensure better preparation of tomorrow's teachers, it is important that their training include both theoretical and practical knowledge. One or two required courses on the dimensions and technical use of ICTs appear necessary but not sufficient. We believe the whole issue of future teachers taking ownership of practical knowledge of a *techno-pedagogical* nature is more complex and requires a rethinking of pre-service programs as a whole. We need only recall that current education reforms at the elementary and secondary level tend to promote a cross-curricular integration of ICTs, i.e. the use of ICTs as a skill across all subjects in the curriculum. However, to allow future teachers to take ownership of that cross-curricular integration of ICTs, it appears imperative that ICTs also permeate their own pre-service programs in a cross-curricular, inter-disciplinary fashion. In other words, ICTs should not merely be the subject of one or two courses, as is currently the case in most faculties of education in Canada, but rather be present in most pre-service courses. In order to promote the cross-curricular integration of ICTs, the pre-service program should be rethought in order to ensure the pervasive presence of ICTs, and the contribution of university teachers should also be reviewed in order to ensure, for example, that all new university teachers involved in pre-service training are able to use ICTs in their courses in a pedagogically effective manner.

#### (B) Multiculturalism

Does teachers' pre-service training contribute to more equitable classrooms and schools for visible minorities and ethnic groups? In other words, are future teachers being prepared for a pedagogical practice that reflects the experiences and cultural diversity of their students, irrespective of the subject being taught? This practice, that Berger (1995) refers to as the inclusiveness of multiculturalism, should not be the subject of a single course, as is the case in the few institutions that have thus far attempted to prepare future teachers for the cultural diversity of today's Canadian schools. It should rather be found in the policies and the purposes of teacher training programs and in the pedagogical practices of education faculties and practicum settings, in order to allow future teachers to appropriate it. In this perspective, multicultural education is no longer one more task for a trainer or one more topic in the curriculum, but rather part of an integrated, global practice in planning the strategies to be used by trainers, through the course material selected, the learning activities put forward, the interaction between trainers and students, the assessment of learning and the integration of students' cultural background.

Thus far, however, the content of the teaching curriculum, as well as the attitudes of trainers and teachers towards students from other ethnic and cultural backgrounds, both in universities and in secondary and elementary schools, have been much criticized. Several reports and studies (Alladin, 1996; Dei et al, 1997; Martin and Warburton, 1998) have highlighted the extent of racism and prejudice in educational institutions. Those studies show that pre-service programs are excessively Eurocentric since they present only aspects of one culture, and rarely allude to issues of ethnicity and discrimination. Birrell (1993) and Paine (1989) have shown that future teachers consider the cultural diversity of the school population as a problem rather than a resource. Now, how are those future teachers being prepared for their work?

On that point the literature is much less extensive. Wideen et al. (1998) deplore the almost total lack of research on the preparation of teachers for work in multicultural settings and call for broader critical studies that could launch a sustained challenge to the structures, practices and myths being perpetuated by pre-service programs. We concur with that opinion. It is high time that research be undertaken at a provincial and pan-Canadian level to: (1) highlight the place of multicultural education within preservice training; (2) describe the way programs and courses are concretely implemented; (3) finally, reveal the importance that major stakeholders attach to multicultural education in teacher training.

#### (C) Education in minority settings

French language schools in minority settings play a crucial role in the communities they serve since they are a key partner, together with the family, in the efforts undertaken to preserve the French language and culture in a majority anglophone setting. Teachers play a crucial role in that process (Gérin-Lajoie, 1993a; Bordeleau, 1993). However, the training of those future teachers rarely takes into account three specific characteristics of minority settings: (1) the high degree of linguistic and cultural heterogeneity of the school clientele, in which some students have French as a dominant language, others English, and yet others have neither French nor English as their first language; (2) the pervasive presence of English in the workplace; (3) and the fundamental — some even say "political" (Welch, 1988) — role of the French-language school in minority settings, a fact of which students do not become fully aware during their training.

In Canada, there are six pre-service training programs for teachers in minority francophone settings (two in the Maritimes, two in Ontario, and two in the West). A review of these programs shows a certain concern for the realities of minority settings, as evidenced by the existence of a few courses (usually quite recent) that deal mostly with the teaching of French to a linguistically heterogeneous clientele. Generally speaking, however, this issue is dealt with at a mostly technical level. The intent is to remedy a problem described as technical, and programs are mostly content to supply tools to teachers to help them deal with linguistic heterogeneity. Nonetheless, novice teachers do not feel sufficiently trained to meet the many daily challenges, largely because of an incomplete knowledge of their work setting as a whole (Gérin-Lajoie and Wilson, 1997).

It is therefore important that pre-service training for teachers working in minority settings address a broader and more critical vision of their roles and the challenges they will be called upon to meet. Such a vision would need to articulate, through teaching and training, the social, political and cultural dimensions of minority-setting education, especially the role of the school in the reproduction of culture and language. Those dimensions are all the more crucial in a context where teaching has a specific mission to preserve the French language and culture in a strongly anglophone setting (OMET, 1994). Within pre-service programs, the place of teachers in minority settings must be reviewed in depth. The same process can be adapted for English language education in minority settings.

# 3. Curriculum, teaching and learning: actors, activities and training systems

As we wrote earlier, the existing model has hitherto been largely designed along multidisciplinary lines. All the reforms undertaken for the past ten years have been attempts to rethink that model, focusing on three major areas of curriculum renewal. These reforms essentially involve a revision of the entire system of teaching and learning in existing teacher training programs.

#### 3.1 The Theory and Practice Debate

The relationship between "theory" and "practice" in the knowledge base of teaching and in the professional preparation of teachers is a topic of long-standing debate in teacher education. This distinction is often posed as a dichotomy between knowledge about teaching and learning developed through university-based research, and professional knowledge that grows out of practical experiences in the classroom. The debate has become more complicated in recent years as notions of "theory" have been extended from knowledge grounded in scientific research by professional education researchers (typically associated with universities) to knowledge created through on-the-job-inquiry into practice by teachers acting as "action researchers" or "reflective practitioners". Recent innovations in some teacher education programs, such as the incorporation of training in classroom-based action research (Kosnik, 1998) and the use of professional portfolios as a vehicle for reflective practice (Hunsburger, 1998) support a constructivist-like image of professional knowledge that blends findings from external research with findings from classroom-based inquiry by teachers on questions arising in practice.

Caution must be exercised in assuming that official descriptions of teacher education programs are accurate descriptions of program implementation. Teacher educators operating within the same programmatic context may hold quite different perspectives on what counts as "theory" and its relationship to practice, and how that relationship should be manifested in programs of initial teacher preparation. Such differences may be substantial in faculties that employ significant numbers of seconded teachers to satisfy staffing needs that cannot be met by the university faculty corps.

One recommendation for Canada-wide research is to explore how the relationship between "theory" and "practice" is presently understood and enacted by teacher educators in teacher education programs across Canada. This would involve research on the beliefs and practices of university faculty, school personnel seconded to assist in the delivery of teacher education programs, and associate teachers involved in practicum placements, in addition to any documentary analysis of official program descriptions.

Historically, the debate surrounding professional knowledge in teaching has focused on the aforementioned theory-practice dichotomy and relationship. Recent teacher and education policy trends in many provinces, however, suggest that this debate should be broadened to encompass the growing presence and use of policy "standards" that define and are intended to control and ensure the quality of pupil learning and teaching practice. In this new standards-based policy environment, the theory-practice debate could easily be displaced by pragmatic concerns about the relationship between standards and practice which are tied to professional and organizational rewards and sanctions. Little is known about the impact of emerging policy standards on initial teacher preparation, nor about the relationship between those standards and education theory, however defined. We would argue that the traditional theory-practice debate should be broadened to encompass the relationship between theory-practice-policy standards.

A second recommendation for Canada-wide research is to examine the emergence of policy standards that increasingly dictate not only what teachers should teach, but what they should know and how they should behave in their role as professional teachers. Such research would include investigation of the impact of these standards on initial teacher education programs across the country, and the interplay between theory, policy standards, and practice in the design and delivery of those programs.

#### 3.2 Towards a better integrated and more coherent curriculum

Most research on pre-service training stresses its fragmentation and lack of coherence. How can this be remedied? Here are some of the areas for improvement suggested in the literature:

- Teaching and learning units (courses, lessons, practicums, workshops, etc.) should be under the responsibility of a true team of trainers including university teachers, teachers from practicum schools and other experts if necessary. Such a team would ensure that units mutually reinforce each other, by creating links between units and a coherent progression. These units should focus clearly and strongly on specific facets of the curriculum, for example, competencies to be acquired or themes to be addressed.
- Short-term units (such as the current 45-hour course) appear to have little impact. Longer-term units (courses of one year or more) lead to more substantial learning by students.
- Another problem is related to the excessive size of student groups and the ever-changing members as they move from one activity to the next. Students should work in small, stable groups, closely followed by trainers working as a team, in order to ensure that the curriculum focuses on their learning and leads to true training.
- The current trend is to move away from a model based on the idea that students *first* acquire knowledge in their theory courses and *then* apply such knowledge in practice, to a model of learning in which theory and practice alternate. Concretely, this means that a portion of theory courses must focus on the practicum experience in order to highlight its theoretical ramifications and reapply these within the training, while practicums are conversely an opportunity to muster all one's theoretical learning and test it against the realities of daily work.

Finally, during practicum and practical training, the determining factor appears to be not so much the duration of the experience as the quality of coaching by university trainers and teachers. In that sense, we need to design a better definition and matching of the roles of trainers and practitioners, so that they may become true partners in the training process, working with student teachers and supporting them collaboratively in the process of challenge, action and development of their own intervention model (rather than merely transmitting pre-existing knowledge and models).

#### 3.3 The transition from pre-service training to integration into a teaching career

A final area of curriculum renewal involves the improvement of the transition between teacher training and the integration phase of a teaching career. A great deal of research in North America and Europe describes the problems and difficulties novice teachers encounter in many areas, in spite of the increasing specialization of their preparation. According to the research, the initial phase of a teacher's career is a period of often traumatic "survival" during which the new teacher overcomes the shock of reality. Unfortunately, beginning teachers seldom enjoy proper working conditions, often being recruited at the last minute for a temporary position and being assigned the worst tasks in the school, the difficult classes and sometimes even a subject they are not prepared to teach (Mukamurera, 1998). Pre-service training does not prepare teachers for such situations and all these problems have negative consequences on professional development and career prospects for beginning teachers. Indeed, some are even led to question their choice of career, or even to abandon teaching.

What conditions can be put in place so that the integration phase can become conducive to professionalization? A first measure could consist in creating an internship system designed to integrate new teachers progressively into the profession, with student teachers being coached and mentored by an experienced teacher and given the time to put in place a professional development project. Action research is needed on this theme in order to evaluate the relevance of that proposal and to establish the conditions in which it can be effectively implemented.

A second measure addresses support for beginning teachers. The initial phase of practice is crucial and novice teachers deserve support and follow-up throughout that process, in order to avoid discouragement or the development of bad habits, and also to promote the acquisition of pedagogical habits, the development of their professional identity and the consolidation of their professional practices. The research points to the usefulness of supports such as collaboration in the workplace (principal, guidance counselor and peers), the assignment of a resource person, sponsorship or mentorship. However, the extent to which such supports are used and their effectiveness in promoting the professional integration of beginning teachers are little known. Before implementing definitive measures, these phenomena need to be better studied and understood.

#### 4. Expected competencies and program evaluation

The objective of pre-service training programs and reforms is to train competent, professional teachers who effectively contribute to student learning. But how can the attainment of that objective be ascertained?

The notion of a knowledge base is one of the significant outcomes of the trend towards the professionalization of teaching and of the growing focus of research on the knowledge and work of teachers. Leaving aside specific issues related to individual areas of the education system, there is a broad consensus on professional competencies covering three key areas of pedagogical intervention: (1) competencies related to the design and management of teaching/learning situations, to the elucidation and the adaptation of teaching, and to the assessment of student progress; (2) competencies required to collaborate with various actors in student training; (3) competencies required for professional development and the engagement of the profession in society.

However, the issue of the nature of the competencies that teachers need to have acquired after their training, as well as the evaluation of such competencies, must be addressed at a more specific level than merely the distant horizon represented by the expertise of an experienced professional. Appropriate systems to evaluate competencies must be developed, different from those customary in a university setting (such as exams and assignments) to judge the attainment of *minimal and accessible competency thresholds* at the end of pre-service training. It is necessary to set minimal thresholds so that society has the assurance that it can successfully entrust a young teacher with educating students. Setting accessible thresholds establishes societal expectations, takes into account the realities of a teacher's career path and communicates clear and realistic standards to pre-service institutions.

Setting such thresholds raises a number of issues, including some with social and ethical repercussions. What sets a competent young teacher apart from an incompetent young teacher? On what basis should the professional skills required for certification be established? Is it sufficient for a beginning teacher to possess specific professional skills, or as proposed by NCATE (2000) should competency standards also take into account the effects of those skills and student learning? Indeed, can such effects be recognized and accessed in order to evaluate candidates? Such issues must be addressed through broad research projects leading to a synthesis of what we know about the effectiveness of beginning teachers, taking into account such parameters as professional responsibility and the rights and respect for the integrity of both students and the novice teacher.

The issue of the nature of new teachers' skills and the mode of evaluation of such skills is not so much a normative issue as a question to be addressed through a broad program of coordinated research dealing with all aspects of pre-service training. Developing the professional knowledge base expected of beginning teachers, setting minimal and accessible competency thresholds at the end of pre-service training, establishing appropriate systems to train and to assess competencies: all these areas are important and could be the object of research right now. To that end, we would propose the following areas of focus:

- Each province and territory could evaluate ways to accredit teacher training institutions on a periodic basis, with much closer monitoring than is the case now.
- We believe that a substantial portion of accreditation criteria should take into account the actual characteristics of pre-service training systems in institutions, such as resources allocated, competency evaluation methods, etc.
- At the same time, trainers should be called upon to provide evidence that pre-service training indeed contributes to the learning of students to whom newly trained teachers are assigned.
- Finally, interested jurisdictions and organizations should encourage right now the development of dynamic, sustained research programs on professional competencies and standards that can be realistically expected within pre-service training. Such research programs should nourish over the coming decade an education and policy debate on the creation of training and accreditation standard systems.

In conclusion, we caution that the issue of standards must be dealt with carefully and sensitively, since while standards can be useful tools to professionalize both the pre-service training and the work of teachers, they can also become straitjackets that reduce teachers' work to a technical vision, devalue their qualifications, and lead to excessive control.

#### Conclusion

Research on pre-service training curricula shows that piecemeal program revision is a mostly futile undertaking. Rather than adding or rejigging content or attempting to evaluate the effects of isolated innovative interventions within fragmented programs, curriculum developers should attempt to situate the process of learning to teach within a new overall vision. Such an alternative vision would challenge traditional multidisciplinary models and propose a new model based no longer on knowledge of the discipline, but on the knowledge of professional action and on competencies; would affirm the need to ground the training process in learning, students and the analysis of practices, rather than in theories transmitted in the form of declarative, specialized, disciplined-based knowledge; and would integrate new knowledge and competencies on ICTs and culture, all the while stressing the need to negotiate reforms with stakeholders in the field and their organizations, in order to avoid overnight, overly hasty changes.

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