

From blackboard to mouse pad:

training teachers for the new millennium

Thierry Karsenti

At the doorstep of the new millennium, teacher education programs face numerous challenges: the growing diversity of student profiles and curriculum reform, as well as the arrival of new technologies. Our changing society, more and more centered on information and communications technologies (ICTs), is giving rise to new educational needs as well as to new teaching methods. The arrival of Web-based courses and other Internet resources presently appears to be one of the great focuses of pedagogical innovations in teacher education programs. In addition, as these innovations greatly augment the possibilities of network implementation and of individual or group learning, the most basic teaching theories and principles such as those of Thorndike (law of effect and law of exercise), Dewey (learning through action), Piaget (construction of knowledge) and Vygotsky (learning as a socio-interactive process) can be applied both more readily and more frequently.¹

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Universities and education faculties play an essential social role and are often perceived as a model or source of innovation. However, in terms of the integration of technologies, the opposite is often the case. Bibeau actually asserts that ICTs are present in every area of society *except* education.² Several studies³ highlight that, while new teachers do have a certain degree of knowledge with regard to ICTs, they have little know-how or *technopedagogical* ability with which to integrate those technologies into their teaching practice. This assertion is not limited to Canada; it applies equally to future teachers in the United States and Europe. The international nature of the problem reinforces the relevance of studies or pilot-projects dealing with this particular aspect of teacher-training.

Elementary and high schools are also victims of the gap between teacher-training and a society immersed in technology, as they are subject to the influence of newly trained teachers and graduates of teacher-training programs. According to many, the difficulties

encountered when ICTs are introduced into schools could be due in part to the absence of models for future teachers. Duchâteau, on the other hand, contends that the failure of technologies in schools results from the disparity between reality and the promises of over-enthusiastic promoters who often launch technologies in schools while the system and teaching practices remain unchanged and therefore unprepared for this transition.⁴

In a world where the explosion of numeric technologies is outpacing the means of accessing knowledge, the integration of ICTs in university pedagogy has a major impact. It leads to a modified task for the teacher-trainer, an altered teaching organization, and a change in the framework for learning and the student's approach to knowledge acquisition.⁵ Until recently, education has dealt mostly with learning about technologies instead of working with them in the context of leaning experiences. However, ICTs should not be considered an extension of the traditional classroom, but rather a tool promoting the use of learning strategies, notably within epistemological perspectives such as those brought forth in the context of constructivism.

With regard to teaching-learning, we can only justify the presence of ICTs in universities and schools if they contribute to the learning goals of the new curriculum and if they provide for better teaching and broader learning.

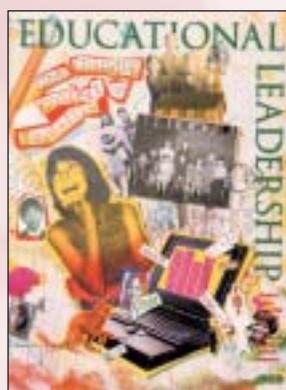
Did You Know...?

Why should technologies be integrated into teacher education programs?

Why should we consider the integration of ICTs in teacher training? Is it because education faculties and schools cannot ignore technologies without the risk of being discredited? From a pedagogical standpoint, that is not the answer. With regard to teaching-learning, we can only justify the presence of ICTs in universities and schools if they contribute to the learning goals of the new curriculum and if they provide for better teaching and broader learning. The effort of integrating ICTs may only be worthwhile if they promote improvements in pedagogy that allow the student to establish a better relation to knowledge. ICTs may also act as catalysts for changes in teaching methods and facilitate transition from a traditional teaching method to a more eclectic array of teaching methods and learning activities leading to the construction of knowledge.⁶ ICTs also bequeath the time to rethink and resituate, in time and space, human exchanges, therefore guiding us to new venues in terms of activities for initial as well as further, in-service teacher-training. In the context of teacher education, can the mission to integrate ICTs be accomplished despite the constant challenges facing already breathless universities? We believe so, particularly in light of certain promising pilot-projects that have been implemented in Quebec.

Integrating ICTs into teacher education programs: promising pilot-projects

Aware of the challenges arising from university teaching, particularly those pertaining to the students' motivation



Some children ...

...who won't look you in the eye are actually showing respect,

...are more motivated by their relationship to past traditions than they are by the prospects of "a brighter future," and

...may need extra help on Mondays because of their lack

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Quand des étudiants et des étudiantes en éducation ont dû suivre des cours sur Internet dans le cadre de leur formation universitaire, cela a modifié leur attitude à l'égard de l'enseignement et de l'apprentissage au moyen des TIC et tout particulièrement, leur notion du temps et de l'espace. Ils ont appris d'une nouvelle façon qui avait l'avantage d'accroître leur motivation. Cette expérience positive en tant qu'apprenants leur a permis de voir l'utilisation des TIC en éducation sous un jour favorable, ce qui les incitera peut-être à les intégrer dans leur enseignement.

to learn and to the development of richer technological environments, we decided to implement four types of Web-based courses and to develop other Web-based resources in a teacher education program:

- 1 a "100%" Web-based course, *Introduction to Educational Research* (the only compulsory, "totally" Web-based course in teacher education programs in Canada);
- 2 a 50 % web-based course in which a Web-based approach or Web-based modules were combined with "regular" in-class teaching;
- 3 a regular-classroom course with Web-based resources and compulsory Web-based activities and assignments;
- 4 a Web-based resource for students during their field experiences in the schools (*practicum, stage*) in the teacher training program.

Results of One Promising Project

The results presented are based on the analysis of data collected during the 18 months of one pilot project (Project #1, a "100 %" Web-based course):

- analysis of more than 5300 e-mails received;

- analysis of synchronous conversations (chat);
- analysis of interviews conducted with student teachers who participated in the project.

A total of 12 groups of 35-55 students took part in this one-semester course offered several times between January 1999 and December 2000. The analyses conducted highlight that students in the course were faced with two important challenges, while also benefiting from several significant advantages.

While it is easy to presume that the technological aspects of the class would pose the most serious obstacles for the student teachers, the results of our analysis demonstrate that this was not

went as learners, when they were faced, in a compulsory situation, with the integration of technologies in the context of a university course (*Introduction to Educational Research*), is likely to shed a positive light on the integration of ICTs in general, and may, quite possibly, create favorable conditions and incentive for further integration of ICTs in their own teaching, either during a practicum or during their professional teaching endeavours. Technologies are then perceived as learning tools with which the learners become more autonomous and more analytical in the face of dilemmas; they must find credible and relevant sources of information in order to answer their own questions. Other advantages have also been identified:

The main difficulty encountered by students seemed to be their lack of autonomy or the trouble they had in learning by themselves, in managing their own learning - in learning anew to learn.



the case: problems related to information technology came in second. The main difficulty encountered by students seemed to be their lack of autonomy or the trouble they had in learning by themselves, in managing their own learning. In other words, as noted by Lamontagne, the students had the most trouble in learning anew to learn.⁷

Despite these obstacles, analysis of the transcribed chat conversations and of the e-mails received exposes the advantage of integrating ICTs into teacher education programs. The pilot-project experienced in Quebec has enabled us to note the change which occurs among future teachers when they are confronted with ICTs in their practical training: a change in their motivation to learn using ICTs, as well as in their attitude towards learning to use ICTs, learning with ICTs and learning about ICTs. The experience they under-

- elimination of physical limits traditionally imposed by the classroom, leading to new, more open access to learning;
- greater access to information and knowledge;
- increased motivation to learn for future teachers;
- better learning, which in turn is more likely to sustain the cognitive development of learners;
- more effective and custom-made teaching;
- more efficient teaching management (for educators)
- improved more frequent communication (among educators and learners, among the learners themselves, but also among the educators);
- enhanced development of critical thought, thanks to increased communication;
- greater autonomy for future teachers.

Conclusion

As Gutenberg redefined access to knowledge with the invention of the printing press, today's society has the potential to make a giant leap forward. Student teachers confronted with the integration of technologies in their learning were called upon to view their relation to time and space differently; they had to acquire a new way of learning which seemingly provided them with increased motivation. However, integrating new information technologies in university pedagogy represents an enormous challenge, and the disturbances that will inevitably follow must be met with both enthusiasm and wariness. The pilot-projects implemented in Quebec have allowed us to ascertain that there are substantial advantages in integrating ICTs in teacher education programs, although there remains a large and considerable gap between the "real" university classroom and the virtual, technology-enhanced university classroom. 

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- 2 R. Bibeau, L'élève rapaillé (Montréal : Université de Montréal, 1999). Document électronique téléaccessible à l'URL : http://netia59.ac-lille.fr/ref/pedagogie/Robert_Bibeau/rapil2.htm
- 3 T. Karsenti and F Larose, Les TIC... *Au cœur des pédagogies universitaires* (Québec : Presses de l'Université du Québec, 2001).
- 4 C. Duchâteau, « Pourquoi l'école ne peut intégrer les nouvelles technologies ? » Contribution au symposium 'L'école de demain à l'heure des technologies de l'information et de la communication, Colloque du REF, Montréal, septembre 1996. Document électronique téléaccessible à l'URL : <http://bigbox.det.fundp.ac.be/~edu/articles/ref2.html>
- 5 G. Lefoe, *Creating Constructivist Learning Environments on the Web: The Challenge in Higher Education*. ASCILITE 1998: Flexibility, the next wave, Wollongong (Australie), 14-16 décembre. Revue électronique téléaccessible à

l'URL: <<http://www.ascilite.org.au/conferences/wollongong98/asc98-pdf/lefoe00162.pdf>>

6 J.H. Sandholtz., C. Ringstaff, et D.C. Dwyer, *La classe branchée. Enseigner à l'ère des technologies* (Montréal : Chenelière / McGraw-Hill, 1997).

7 D. Lamontagne, « L'autonomie des apprenants à distance, » *Infobourg, La revue de la pédagogie branchée 2*, no.1 (1999): 24

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