

Can ICT Reduce Drop-Out Rates Among New Teachers? A Qualitative Study in Canadian Student Teachers

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Introduction

A paradox has arisen in the literature on information and communication technologies (ICT) appropriation by teachers during their internship and professional induction. On the one hand, some studies show that, at the completion of their basic training, new teachers have a good grounding in technology skills (Clausen 2007; Karsenti et al. 2007), feel fairly confident about using ICT (Moore and Chae 2007; Slaouti and Barton 2007; Russell et al. 2003), and use ICT regularly in their personal life and professional practice, albeit mainly for lesson planning (Clausen 2007; Karsenti et al. 2007; Slaouti and Barton 2007). On the other hand, studies show that new teachers hold more negative beliefs about how ICT impact students than more experienced teachers do (Russell et al. 2003). They also show little ability to integrate ICT pedagogically and a low tendency to introduce them into the classroom (Karsenti et al. 2007). Here again, there is a significant difference from experienced teachers (Russell et al. 2003).

This finding is all the more surprising in light of the fact that new teachers have been trained according to a socioconstructivist vision of learning, as defined by the ministry of education in Quebec, Canada (Ministère de l'Éducation du Québec (MEQ) 2001a, b). According to some authors, teachers who adhere to this approach should be in favor of the pedagogical integration of ICT (Becker 2001; Ravitz et al. 2000). They would also be expected to turn to their peers to help them learn how to do this. However, this is apparently not happening.

In fact, the recent research has shown that, in addition to being somewhat reluctant to integrate ICT pedagogically, new teachers are also slow to use ICT for their professional development and to seek support when they need it (Moore and Chae 2007;

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Schuck 2003). On this subject, Schuck (2003) confirms that new teachers use the Internet in the same way they used it during their basic training, that is, mainly to look for information and resources, and considerably less to keep in touch with their peers through online communities.

This underuse of ICT to obtain support is particularly troubling during the professional induction phase, referred to by some as the “survival” period, when inexperienced teachers are especially in need of backing and encouragement. The problem can be seen in the excessively high numbers of teachers who quit the profession in the first 5 years, not only in Quebec [between 15 (MELS 2006, cited in Martineau et al. 2008) and 25% (Tardif 2001)], but also in North America [46% in the U.S. (Ingersoll 2002)], and around the world [40% in the first 3 years in the U.K. (Stoel and Thant 2002)]. Moreover, teaching has one of the highest drop-out rates of all professions (Ingersoll 2002).

For all these reasons, the Conseil supérieur de l'éducation (Quebec's superior council of education) (CSE 1997), the MEQ (1992), and the Ontario College of Teachers (2003) have addressed the issue of professional induction and recognized the urgent need for action. In the wake of their pronouncements, the Comité d'orientation de la formation du personnel enseignant (Quebec's advisory committee on teacher training) (COFPE 2002) drew up a set of recommendations for the professional induction of teachers and submitted them in a brief to the MEQ. The brief included a specific recommendation for “a process for induction into the teaching profession” (Recommendation 9). On this point, Chen (2008) affirms that it is important for researchers to help teachers “to cope with the difficulties and the complexities of classroom life” (p. 74). In this empirical study, we take a look at how ICT can support teachers in the professional induction phase.

Objective

We wanted to deepen our understanding of the potential benefits of ICT for practical teacher training and professional induction. More specifically, we aimed (1) to identify the difficulties that interning and new teachers encounter; and (2) to better understand how ICT can help them overcome these challenges. Results are presented from two pilot studies conducted in Canada during the internship of student teachers and the professional induction of new teachers.

Context

To set the context for our study, we begin by underscoring the important role of the internship in initial teacher training programs in Quebec and some of the inherent problems. We then discuss the issue of teacher drop-out during the professional induction. Finally, we discuss the potential of ICT to support student teachers and new teachers.

The Teaching Internship in Quebec: A Challenging Context

Practical training is an important aspect of university teacher training programs in Quebec, Canada. Student teachers spend 120 days of their 4-year university program interning in secondary schools to develop their professional skills. According to Nault and Nault (2001), internships give teachers-to-be an opportunity to test themselves in real schools. In Canada, teacher training programs focus on the development of professional skills that are grounded in professional practice. School internships are opportunities to apply professional competencies to real situations and assess performance. Therefore, it became essential that “the university community must have more opportunities to experience real-life teaching firsthand” (MEQ 2001, p. 27). This gives student teachers a chance to show that they possess the skills to become effective professionals.

During the internship, student teachers are supervised by two educators: (1) the university supervisor, who makes regular visits to observe student teachers in practice; and (2) the cooperating teacher, usually a classroom teacher, who temporarily mentors the student teacher. The university supervisor is therefore key to helping future teachers transfer their academic knowledge into practice. At the other end, the cooperating teacher plays a front-line role, coaching future teachers day-to-day and integrating them into the classroom and the teaching team. These two educators collaborate to assess the student teacher. The assessment is based on a set of 12 professional teaching competencies, each made up of various components (MEQ 2001). The eighth competency is “To integrate ICT in the preparation and delivery of teaching/learning activities and for instructional management and professional development purposes” (MEQ 2001). Thus stated, ICT skills are transferable skills that can be applied to several teaching areas.

Nault and Nault (2001) point out that university supervisors are often required to leave the university in order to observe interning students in the classroom, even when the schools are located far away. In Quebec, aside from the traveling that generates considerable time loss, supervisors have increasing numbers of interns and are required to visit each one more often. When students intern in areas so remote that a visit can take all day, assuming that the weather allows a same-day return, supervision can be a daunting task. In these circumstances, it is also difficult for university supervisors to maintain continuous collaboration with the cooperating teachers and their students between visits.

This situation is not only highly inconvenient for university supervisors, it is also frustrating for the students and cooperating teachers, who have complained about the decreased availability of professors and other university staff (Bourbeau 1997). Furthermore, many studies, e.g., by Barker (1986), Zeichner (1992), O’Neill (1996), and Venn, Moore and Gunter (2001), have shown that interns often feel isolated during their internship, when they have few, if any opportunities to share their experiences with their peers. Nault and Nault (2001) suggest that one way for students to escape this isolation would be to share their daily classroom experiences with others in the same situation.

Professional Induction of Teachers in Quebec and the Problem of Teacher Drop-Out

Drawing from Macdonald (1999), we define teacher drop-out as premature departure from the teaching profession, whether voluntary or not. In fact, the studies we consulted (see Karsenti et al. 2008) clearly show that teacher attrition (referred to as drop-out in the present study), far from being confined to retiring veterans, is connected to the issue of induction into the teaching profession. In this perspective, novice teachers (those having less than 7 years of experience), not experienced veterans, are the ones who are quitting most frequently. Teacher drop-out is not without consequences in terms of both education costs (Alliance for Excellent Education 2004; OECD 2005) and education quality (OECD 2005; Stoel and Thant 2002). This is particularly due to the need to hire more teachers, who are themselves in the process of building their skills, such that they have not yet developed optimal teaching practices. Moreover, teacher drop-out is also an international problem (see, e.g., Borman and Dowling 2008; Dolton and Van der Klaauw 1995; Ingersoll 2002; Stoel and Thant 2002), albeit to a varying degree. The question therefore arises as to why new teachers drop out, which leads in turn to the question of drop-out factors. The literature on teacher drop-out reveals a number of factors, as follows:

- (a) Task-related factors: a demanding and time-consuming job, management of difficult classrooms, unsatisfactory work conditions, inappropriate teaching subjects, restrictive administrative policies, and unappealing tasks.
- (b) Individual factors: emotional and psychological characteristics those are incompatible with the teaching profession, and sociodemographic and professional factors.
- (c) Social environment factors: difficult relations with education and social actors and difficult students and workplace conditions.
- (d) Socioeconomic conditions.

We also decided to add a fourth, more general category called *socioeconomic conditions*. Macdonald (1999) notes that socioeconomic conditions can be more or less conducive to attrition in young teachers. In other words, tough economic times might compel some young teachers to remain in the profession, despite any difficulties encountered. Alternatively, very positive economic conditions, in which other jobs are easy to find, might encourage teachers to quit.

Integrating ICT: How Do They Support Interning and New Teachers?

With the increasing disparity between technology's relatively modest presence in the classroom and its ever increasing popularity in society at large, it has become imperative for universities, and especially education faculties and departments, to bridge this technological gap. In the wake of the reform of teacher training programs

in 2001 (MEQ 2001), and considering the importance placed on integrating ICT into these programs, the need to promote the potential benefits of ICT and their use by future teachers is self-evident. They should not be introduced as an appendage to academic training, but rather as an integral component of a global, cross-curricular approach throughout the entire teacher training process. In this perspective, the pedagogical integration of ICT into teacher training programs is promising for two reasons: (1) it gives future teachers a chance to develop their skills in integrating ICT into their teaching practice in real classroom situations; and (2) it could help them overcome some of the problems identified in this study. For example, online interactive environments would enable future teachers to escape the isolation of their internship, in addition to making it easier for university professors to monitor their progress (Karsenti et al. 2002). The potential of ICT support would apply equally to new teachers in the professional induction phase. Studies have shown that two of the most important factors in adequate mentoring are access to computer equipment and human support at all times. Almås and Krumsvik (2007) reported that the most effective way to foster skill development in teachers was to provide them with a laptop computer. Schuck (2003) even recommended giving a laptop computer with Internet access to all new teachers for the duration of the professional induction year, to provide them with continuous access at any time and in any place. Many studies have confirmed that continuous access to pedagogical and technical support is a crucial facilitating factor in overcoming obstacles (Allaire 2006), for both ICT integration (Granger et al. 2002) and professional induction (Nault 2005). In addition, some support mechanisms, including mentoring (Vallerand and Martineau 2006), online practice communities (Nault 2005), and a virtual teachers group (Shoffner 2009) appear to facilitate professional induction. Thus, as the entry into teaching is often marked by professional isolation, ICT can be used as networking tools to help new teachers buy into a collective vision of peer-supported professional development (Lieberman 2000).

Method

The aim of this study was (1) to identify the difficulties that interning and new teachers encounter; and (2) to better understand how ICT can help them overcome these challenges. This section presents the methodology used in two exploratory empirical studies: one addressing teacher internship and the other, the problem of new teacher drop-out.

Subjects and Data Collection

Study on teacher internship: A total of 800 preservice teachers (682 women, 118 men) enrolled in a 4-year teacher training program were selected to participate in the study. Subjects had a mean age of 22 years. They were enrolled in the second, third, and fourth year of a 4-year secondary school teacher-training program.

First-year students were not included in the study because they have little internship experience at that stage. A questionnaire was administered to all teacher interns in the second, third, and fourth years of a secondary school teacher training program, for a total of 1,140 potential participants. We received 800 completed questionnaires, which is 70% response rate. The questionnaire comprised two main sections: one addressing problems that teacher interns encountered in their internship, and the other addressing the role and importance of ICT in overcoming these problems. Most of the questions were open-ended (aside from those designed to gather socio-demographic information) so as not to direct the respondents' answers. This was consistent with our exploratory approach. We then performed a content analysis of the responses, as described below.

Study on new teacher drop-out: To better understand the factors at play in the problem of new teacher drop-out, we used an online questionnaire, which has the advantage of being administered via the Internet, thereby, transcending limitations of time and space. The questionnaire is based primarily on our literature review, from which we retained the most frequently cited drop-out factors. It was tested on 26 teachers and 11 school staff (school principals and pedagogical counselors), whose comments helped us improve the questions. Several themes were addressed, such as reasons for quitting, conditions for preventing drop-out, human support available to drop-out teachers experiencing problems, teaching as a career choice, professional aspirations to become a teacher, and the degree of satisfaction of drop-out teachers prior to leaving the profession. The questionnaire contained both open-ended and closed questions. We mobilized all the members of the Canadian Association of Immersion Teachers so that the questionnaire would be widely distributed. To complete the distribution procedure, we published ads in five newspapers in two languages (French and English) in the cities of Halifax, Toronto, Calgary, Vancouver, and Montreal. In this way we were able to reach participants across the country for a Canada-wide survey. The questionnaire was posted online for 3 weeks, and 34 drop-out teachers responded.

Data Analysis

Study on teacher internship: Data were analyzed using a grounded theory approach, more precisely, an ethnographic content analysis (Altheide and Johnson 1994). This type of content analysis includes many of the traditional content analysis procedures (e.g., Huberman and Miles 1994) in addition to a group feedback analysis and constant comparison methods, as used in grounded theory studies (Tesch 1990). Under this general qualitative analysis framework, the collected data were coded in order to generate concepts. "Coding represents the operations by which data are broken down, conceptualized, and put back together in new ways. It is the central process by which theories are built from data" (Strauss and Corbin 1990, p. 57). We performed the data coding in three phases: induction (reading all the data to allow concepts or codes to emerge), deduction (coding all data and labeling each segment), and verification (verifying all coded data). We used an initial analytical

induction (e.g., Strauss and Corbin 1990) to derive categories of meaning from the data, called coding concepts. We then reiteratively verified the coding to further define and refine the concepts. In the end, nine concepts emerged to represent the problems that teacher interns encountered in their internship (see section “Results” below), as well as the potential for ICT to overcome these problems.

Study on new teacher drop-out: The data obtained from the questionnaires comprise both Likert scores and open-ended responses. Accordingly, the analysis of results is mixed. The quantitative analysis includes descriptive and inferential statistics, developed using SPSS 13. This enabled us to draw a sociodemographic portrait of the participants and uncovered some interesting facts concerning teacher drop-out. The initial results were further investigated by a qualitative analysis using QDAMiner. It consisted of a content analysis (see Huberman and Miles 1994; L'Écuyer 1990) with semi-open coding, initially constructed from the various factors influencing drop-out (see the section “Professional Induction of Teachers in Quebec and the Problem of Teacher Drop-Out”), as follows: task-related factors, individual factors, and social environment factors. The qualitative analysis aimed to highlight the relationships between the different moderators of drop-out identified in the quantitative analysis.

Results

In this section, we first present a summary of the challenges that teacher interns and new teacher drop-outs encountered during the internship or profession induction, as reported in the questionnaires. We then outline how ICT could help them overcome these challenges.

Main Challenges Encountered by Teacher Interns and New Teacher Drop-Outs

As shown in Table 1, the main obstacle that teacher interns faced in their internship was overall classroom management. Thus, almost 37% of respondents reported classroom management as a major difficulty. Assuming authority, being assertive, enforcing rules, and dealing with difficult students are some examples of classroom management challenges. Almost 25% of respondents mentioned planning and evaluation. The quality and quantity of material resources were also problematic. More than 10% of respondents stressed that teaching materials were often outdated, inaccessible, or imposed by the cooperating teacher. The school where the internship took place, including the school's pedagogical organization (e.g., number of students per class), and student or community characteristics (multi-ethnic clientele, at-risk students, underprivileged environment) posed further challenges. About 14% of the respondents mentioned at least one of these characteristics as a problem. It is noteworthy that a significant number of respondents (3%) reported that the greatest

Table 1 Main problems encountered by student teachers during the internship (*n* = 800)

Problem	Percentage
Classroom management	36.4
General teaching abilities (planning, evaluation)	24.9
Guidance provided by and teaching philosophy of cooperating teacher or university supervisor	13.7
Teaching circumstances (e.g., number of students per class, social and cultural context, multi-level classrooms, parents, types of students, teaching subjects)	13.5
Teaching resources	11.1
Personal characteristics (e.g., self-confidence, anxiety, openness)	8.8
Internship organization (e.g., placement, distance, evaluation, length)	6.1
Integration into the workplace (e.g., communication with other teachers in the school)	3.4
Language (e.g., code mastery, communication)	2.6

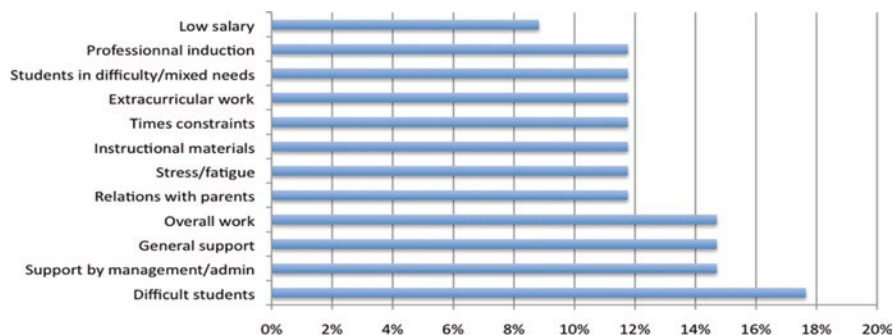


Fig. 1 Main reasons for leaving the profession according to the drop-out teachers (*n* = 34)

challenge was their insufficient mastery of the teaching language, oral or written, in order to carry out their teaching activities.

Another problem stemmed from the internship experience itself. 13% of respondents mentioned that the cooperating teacher (and less often, the university supervisor) posed an obstacle by providing insufficient guidance in terms of feedback, support, availability, or interest; by granting the student teacher insufficient leeway; by presenting a counter-model, with a negative, bitter, or inappropriate attitude toward the students; or by creating conflicts between the cooperating teacher and the student teacher. Other aspects related to the internship arrangements created problems for approximately 7% of respondents, particularly the distance between their home and the school, as well as certain internship requirements (e.g., writing a report, attending seminars). Finally, more than 10% of respondents mentioned personal problems, such as lack of self-confidence, stress caused by the internship arrangements, or financial difficulties and the challenge of reconciling internship requirements with paid employment. Note that other problem categories were cited, but by fewer respondents, for instance, the challenge of fitting in with the school staff.

It is noteworthy that the difficulties encountered by new teacher drop-outs (see Fig. 1) are similar to those encountered by teacher interns, as we explore next.

Table 2 How information and communication technologies (ICT) helped teaching, as reported by student teachers ($n=800$)

How ICT helped teaching	Percentage
Helped them create a variety of learning activities	60.0
Increased access to a variety of teaching resources	29.0
Helped them present new concepts, theories, ideas, etc.	22.0
Helped motivate learners	21.0
Helped them communicate with education and school stakeholders	15.0

Thus, the first set of drop-out factors includes difficult students, relationships with parents, and students in difficulty or with mixed needs, all of which are closely connected to the problems of classroom management and the teaching circumstances mentioned by teacher interns (see Table 1). All these factors are related to the social environment factors presented in the section “Professional Induction of Teachers in Quebec and the Problem of Teacher Drop-Out.” The second set of drop-out factors concerns the overall lack of support, and more particularly support by the school administration, which may be related to the problems with the mentoring teacher or the university supervisor and integration into the workplace encountered by teacher interns (see Table 1). These factors are again related to the social environment factors. A third set of drop-out factors concerns problems related to professional induction, such as the workload and the lack of time that stresses new teachers, especially as they are in the process of building their professional skills. These factors may also be related to the inadequate teaching skills that hinder teacher interns (see Table 1). This set of factors relates to the task-related factors mentioned in the section “Professional Induction of Teachers in Quebec and the Problem of Teacher Drop-Out.” Still other factors identified by new teachers, such as stress, fatigue, and the lack of instructional materials, are also factors that affect teacher interns (see Teaching resources and Personal characteristics, Table 1).

In view of the similarity observed between the problems encountered by teacher interns during the internship and the drop-out factors for new teachers, we may posit that the challenges of the internship remain much the same during professional induction.

How ICT Helped Teaching

As shown in Table 2, ICT appear to have helped student teachers cope with many of the teaching tasks and challenges encountered during the internship. The greatest advantage of using ICT appears to be the variety of activities that teachers can do in the classroom, as reported by 60% of all respondents. ICT appear to help them diversify both their teaching strategies and their students’ tasks.

As reported by 29% of respondents, ICT helped them to be more professional and gave them increased access to a wide variety of up-to-date resources, so they could improve their teaching and learning activities. More than 20% of the

respondents emphasized that ICT helped them present new concepts, theories, and ideas. Many noted that ICT helped them motivate their students, a considerable challenge, especially in secondary school. Moreover, 21% reported that their students were interested in ICT, and that ICT made learning more relevant and fun. Some respondents (15%) also reported that ICT were very useful ways to increase their communication with the various actors involved in their internship (e.g., cooperating teacher, university supervisor, colleagues, other teachers, parents). They appreciated having ICT to communicate, as it allowed them to share ideas, talk over problems, and get past difficult moments, which, according to most, were easier to deal with when they knew that others were facing them as well. Finally, it is noteworthy that less than 4% of respondents reported that ICT were useless in helping them overcome the teaching challenges they encountered in their internship. Our findings on the number and content of interactions reveal that student teachers tend to participate actively in online interactions, wherever they are located. The frequently mentioned collaboration and sharing of experiences promote solidarity and mutual assistance. Teacher interns develop bonds within a dynamic learning community, providing them with the encouragement and confidence to develop their professional skills.

Discussion and Conclusion

Based on the literature, our findings on the problems of teacher interns are similar to those for teachers in the transition to professional practice, and are particularly relevant to the issue of teacher drop-out. Classroom management heads the list of problems reported by our surveyed teacher interns. This result is consistent with the literature on new teachers, for whom classroom management is the greatest concern (Evertson and Weinstein 2006; Kagan 1992; Veenman 1984). Other general teaching abilities, such as planning and evaluation, are also considerable problems for teacher interns. This is understandable, given that they are in the process of building their professional skills at this point. The lack of guidance and the teaching philosophies of cooperating teachers and university supervisors constitute the third most often reported problem by our teacher interns. The literature review by Hobson et al. (2009) on mentoring beginning teachers concurs with this finding. These authors noted that successful mentoring depends on a number of conditions in the environment, and that these conditions vary considerably across educators. They identified three potential limitations of mentoring: lack of support by the educator; inversely, lack of autonomy granted to the teacher intern in developing professional skills; and an exaggerated focus on technical aspects of teaching, to the detriment of more fundamental pedagogical issues.

In our case, some of the results, such as lack of feedback, support, availability, or interest and insufficient leeway granted to the teacher intern, appear to fall under the first limitation identified by Hobson et al. (2009) (lack of support). On the other hand, we obtained some more extreme results that were not covered in the literature

review by Hobson et al. (2009). For instance, one educator was characterized as a counter model: someone who is negative, bitter, or who displays an inappropriate attitude toward the students or who creates conflicts between cooperating teachers and student teachers. The challenge of teaching circumstances, which we identified as the fourth problem that teacher interns encountered, appears to echo several motives cited in the literature on teacher drop-out, for example, difficult relationships with parents (Certo and Fox 2002; Gonzales 1995; Macdonald 1999; OECD 2005) or with students (Chaplain 2008; Gonzales et al. 2008; Kirsch 2006; Ingersoll 2001; Macdonald 1999; OECD 2005). From the similarities between the problems encountered by teacher interns and new teachers, we may cautiously argue that the problems that future teachers face in their internships remain much the same as they enter professional practice. In this view, the teaching internship would be an integral part of the transition to professional practice, i.e., professional induction.

Concerning the potential of ICT to overcome problems encountered by teacher interns, it is noteworthy that the second potential benefit of ICT (increased access to a variety of teaching resources) appears to respond directly to the fourth most often mentioned problem by teacher interns (teaching resources), and to the seventh drop-out factor mentioned by new teacher drop-outs (instructional materials). ICT as a source of motivation for learning constitutes our fourth potential benefit. This finding is well supported by the literature on ICT in education (see the literature review by Balanskat et al. 2006). The same holds true for the last potential benefit of ICT (helped them communicate with education and school stakeholders), which is also frequently cited in the literature (Karsenti 2005; Lameul 2008), and which appears particularly relevant for rural schools (Fry and Bryant 2007).

An analysis of the data gathered so far suggests that ICT help student teachers cope with pedagogical and other challenges encountered during their internship and the professional induction in various ways. ICT allow student teachers to take advantage of a vast network in order to maximize their academic performance and to become more confident and comfortable in the sometimes difficult situations that can occur in schools. This also holds true for new teachers during professional induction. Although ICT may be challenging for internship supervisors, these challenges should be met head-on through innovative pedagogical practices and further research.

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