Teacher Supply and Demand: Issues in Northern Canada

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This two-year study (2007-2009), which examined teacher supply and demand issues in northern Canada – Fort Nelson School District (BC), the Fort Vermilion School Division (AB), the Yukon Department of Education (YK), and the Yellowknife School District (NWT) – comprised three research objectives: (a) to ascertain in which subject areas acute and chronic needs for teachers existed, (b) to investigate recruitment and retention methods for northern professionals, and (c) to ascertain preferred professional development models. The participants included teachers, principals, and hiring personnel in the research sites. Research methods included the use of an on-line questionnaire (n = 113), at least two semi-structured interviews at each of the four sites with five to ten teachers, three to five principals, and one Human Resources personnel, and researcher field notes. Findings confirm and expand upon conclusions drawn by others and demonstrate the unique needs of northern educators. In particular, we found that (a) school districts continue to struggle with finding specialist teachers in the senior high sciences and mathematics and in elementary Special Education, (b) few incentives exist for teachers to come to northern school districts and to stay there, and (c) the preferred professional development model for approximately one-quarter of these Northern teachers, administrators, and hiring personnel is blended learning.

Key words: rural education, professional development, northern Canada, retention and recruitment

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Cette étude, qui s'est déroulée sur deux ans (2007-2009), portait sur les questions d'offre et de demande en lien avec les enseignants dans le nord du Canada, notamment dans la commission scolaire de Fort Nelson (C.-B.), la division scolaire de Fort Vermilion (Alb.), the Department of Education du Yukon (Yukon), et la commission scolaire de Yellowknife (T.-N.-O.). Les chercheurs poursuivaient trois objectifs : (a) découvrir pour quelles matières il existe des besoins ponctuels et chroniques en matière d'enseignants; (b) enquêter sur les méthodes de recrutement et de maintien en poste des professionnels dans le nord du Canada; (c) déterminer quels sont les modèles de perfectionnement professionnel préférés. Les participants incluaient des enseignants, des directeurs d'école et des spécialistes du recrutement dans les divers sites de recherche. Les méthodes de recherche comprenaient l'utilisation d'un questionnaire en ligne (n = 113), au moins deux entrevues semi-structurées à chacun des quatre sites avec cinq à dix enseignants, trois à cinq directeurs d'école et un membre du service des ressources humaines ainsi que des notes prises sur le terrain par les chercheurs. Les données recueillies confirment et poussent plus loin encore les conclusions d'autres chercheurs et démontrent les besoins tout particuliers des enseignants en poste dans le Nord. Les auteurs ont découvert, entre autres, que les commissions scolaires continuent à avoir de la difficulté à trouver des enseignants spécialisés dans les sciences et les mathématiques du dernier cycle du secondaire et des orthopédagogues au primaire, que peu d'incitatifs sont offerts pour attirer et maintenir en poste des enseignants dans les commissions scolaires du Nord et que le modèle de perfectionnement professionnel préféré pour à peu près le quart des enseignants, des administrateurs et des spécialistes en recrutement est la formation mixte.

Mots clés : éducation en milieu rural, perfectionnement professionnel, nord du Canada, recrutement et maintien en poste.

The supply and number of specialist teachers in Canada in general and in the North in particular are in jeopardy (Alberta Learning, 2003; British Columbia Public School Employers' Association [BCPSEA], 2009; British Columbia Teachers' Federation [BCTF], 2000; Brown, Chasteauneuf, McGregor, & Procter, 2005; Dove, 2004; Nova Scotia Department of Education, 2007). There is an overall anticipated shortage of teachers because the retirement rate has accelerated in the last 10 years and the number of teachers graduating has declined in relation to this retirement trend (Alberta Learning, 2003; BCPSEA, 2009; Nova Scotia Department of Education, 2007). The shortage will likely be more severe in historically under-

served northern and rural areas. Many retiring teachers are presently teaching in urban areas resulting in teachers from northern and isolated communities moving south to fill job vacancies created by these retiring teachers. Rural teachers lament having to leave their communities, but job opportunities in urban areas are a strong draw (Corbett, 2009). Northern communities need incentives for recruiting and retaining teachers to counter the southerly flow of teachers.

Over the years, specialist teachers have been in high demand, but short supply, in British Columbia, especially in northern districts. Graduates from all post-secondary programs in British Columbia have not been able to meet the demand for teachers in speciality areas such as senior level Physics, Chemistry, Mathematics, Business Education, Technology Education, Home Economics, Trades, and Modern Languages (Echols, Grimmett, & Kitchenham, 1999; Grimmett & Echols, 2000). To accommodate potential students in these areas, some teacher education programs have changed the prerequisite requirements and used a quota system to guarantee enrolment. According to the British Columbia Teacher Supply and Demand Consortium (F. Echols, personal communication, October, 2009), the quota system has failed to fill all guaranteed seats and therefore these shortages continue.

In the present study, from 2007-2009, we examined the teacher supply and demand issues in isolated northern districts. In this study, we sought to learn the recruitment needs of the 56 participating schools in relation to specialists and generalists teachers. Specifically, we investigated the "northern needs" in the participating schools of the Fort Nelson School District (British Columbia), the Fort Vermilion School Division (Alberta), the Whitehorse Department of Education (Yukon Territory), and the Yellowknife School District (North West Territories). We focused our research on three areas: (a) the existing recruitment and retention practices with district personnel, (b) the chronic shortage of specialist teachers, and (c) the professional development needs of northern teachers in relation to the modes of professional development and their topics of interest. Research methods included the use of an on-line questionnaire to teachers, administrators, and Human Resources personnel in the participating 56 schools (n = 113), at least two semi-structured interviews at each of the four sites with five to ten teachers, three to five prin-

cipals, and one Human Resources personnel, and field notes kept by each of the two researchers.

REVIEW OF THE LITERATURE

In the Canadian context, few studies have examined northern school districts' need to recruit and retain teachers in specialty teaching areas (Barley, 2009; Brown, Chasteauneuf, McGregor, & Procter, 2005; Ingersoll, 2003; Ingersoll & Curran, 2004). Much of the research that has been undertaken has been descriptive in nature (e.g., Alberta Learning, 2003; BCPSEA, 2009; Canadian Teachers' Federation, 2000), identifying perceived problems emerging from supply and demand issues. This research often examined already existing demographic statistics (e.g., teacher attrition, declining student enrolments) to identify trends and predict future areas of need. The solutions adopted, however, such as financial incentives for teachers who accept appointments in northern and rural areas (Alberta Learning, 2003), are often obviated by these teachers returning to larger, urban areas following short stints "away from home." More recently, the identified needs of districts has resulted in research to examine the potential of on-going professional development to help districts meet these needs (e.g., Wallin & Reimer, 2008).

Teacher Retention

Calls for solutions that have centred around money sometimes oversimplified the problem of teacher retention. Kitchenham (2001), who interviewed key personnel in four rural school districts, reported that incentives for teacher retention were not always in place, noting that a superintendent of a large rural school district argued for more money on the assumption that money was a major incentive for teachers to stay. Kitchenham also reported that although teachers enjoyed teaching in rural districts, they felt conflicted because they could teach in a more urban district and earn the same amount of money.

Although some northern Canadian school districts provide financial incentives to their teachers, it is likely other factors relating to rural and northern issues have an impact upon a teacher's decision to accept employment or to remain in these geographic areas. For example, Alberta Learning (2003), in surveying rural teachers, asking what retention strat-

egies would be beneficial for staying in rural schools, found that the most recommended strategies were the following: (a) professional development opportunities (97% of respondents), (b) induction/mentorship programs to support teachers (94%), and (c) financial incentives to new teachers contingent on service commitment (85%). Respondents in the North and North Central regions were more specific in their suggestions for incentives to stay in northern schools. Their suggestions were (a) to include tax incentives for re-locating to the rural and isolated school districts, (b) to establish university education outreach programs in rural community colleges so that generalist teachers could take specialist subject area training, and (c) to provide local professional development programs for teacher upgrading in the specialist subject areas.

Teacher Shortages and Attrition

Surveys from other school districts in Canada reveal on-going teacher shortages which are reflected in northern and rural school districts. Urban school districts hire new graduates from the universities and look to the rural areas to supplement their existing teaching force (BCPSEA, 2009; Guarino, Santibañez, & Daley, 2006; Santiago, 2001). This trend places further pressures on northern and rural school districts. When the Canadian Teachers' Federation (CTF) (2000) surveyed school districts across Canada, respondents from the districts reported factors that would affect teacher shortages by 2005, specifically the retirement of teachers. On the CTF survey, both the Yukon and Northwest Territories districts (now split into two entities: Nunavut and the Northwest Territories) noted that the integration of special needs students was a major factor in the increasing teacher shortages. As well, the Territories reported an additional factor concerning teacher retention: the high turnover rate (67%) of beginning teachers.

Other groups have also investigated teacher shortages in Canada in relation to declining enrollment and population growth fluctuations (BCPSEA, 2009; Alberta Learning, 2003; Nova Scotia Department of Education, 2007). These reports have noted the decline in student enrolment, resulting in teacher attrition. The New Brunswick Department of Education (2001) noted that they reassigned teachers to rural areas. These studies demonstrate that a decline in provincial student enrolment affects

teacher attrition; however, provinces vary on the actual supply of new teachers. Nevertheless, there is a need to replace teachers in northern areas in British Columbia and Alberta as well as the Yukon and North West Territories.

Teacher Shortages in Specialization Areas

Although shortages of generalist teachers concern northern and rural districts, more critical teacher shortages occur in many areas requiring specialized knowledge and pedagogy. The Canadian Teachers' Federation (2000) findings for the geographical areas examined in this present study indicated that of the administrators surveyed – 45 per cent (Alberta), 56 per cent (British Columbia), and 67 per cent (Yukon and Northwest Territories)– school districts found it difficult to attract qualified teachers for specialty areas.

Grimmett and Echols (2000) conducted a study on teacher supply and demand in British Columbia. They identified significant, widespread shortages in many specialized teaching areas in all 12 districts under study and confirmed that

> Shortages were particularly acute at the secondary level, where [they] found across-the-board shortages (that is, in each metropolitan, urban, and rural district) in Fine and Visual Arts, French, Chemistry, Physics, Mathematics, Business Education, Home Economics, and Technology Education. At the elementary level, [they] found similar shortages in French immersion, French-as-a-second-language (FSL), English-as-a-second-language (ESL), Special Education, and Music. (p. 332)

Further, Grimmett and Echols found distinct differences across the three regions, metropolitan, urban, and rural. Rural districts had trouble finding Computer Science teachers, counsellors, and First Nation Language and Culture teachers as well as counsellors, school psychologists, and librarians. Grimmett and Echols noted that in all regions qualifications for specialty positions were being relaxed due to the shortage of qualified applicants.

Grimmett and Echols (2000) reported that the four rural districts in their study did not identify surplus areas and several reported difficulties in recruiting and retaining teachers with appropriate specialty-area

qualifications. The respondents indicated shortages in Business Education, French, Home Economics, Technology Education, Fine and Visual Arts (Art/Drama), Mathematics, and Science. Special Education teachers were also in high demand, as were teachers of Music, French, French Immersion, and First Nation Language and Culture. We find it logical to conclude that as positions become available in metropolitan areas, an out-migration of rural teachers will occur as they seek positions in cities with more amenities and easier access to professional development.

Alberta Learning (2003) predicted that by the 2010 school year the province would need teachers in technology education, senior high Sciences and Mathematics, Human Ecology, French Immersion (all grades), junior and senior high French, junior high Fine Arts, Resource Room, Aboriginal languages, and Business Technology. They also cautioned that the North or North Central regions of Alberta would have the strongest need for specialist teachers. The study recommended that the four Alberta universities should increase the number of post-secondary spaces available for the high demand areas. Germane to the present study, they also recommended that the Alberta government agencies should "develop additional brokering programs with Alberta universities to deliver Bachelor of Education programs in rural areas" (p. 13) to ensure that new teachers become familiar with the demands of teaching in rural areas so that rural school districts, like Fort Vermilion in this study, would have a ready supply of teachers. To date, Alberta has made small advances toward that goal with all four Education programs (University of Alberta, University of Calgary, University of Lethbridge, and Faculté Saint-Jean) placing more students in northern Alberta, but no deals have been formally brokered.

Professional Development for Rural Professionals

According to Seltzer and Himley (1995), educators have long recognized that "rural schools face special challenges in providing continued professional development to their staff – geographic isolation of teachers and schools, limited availability of staff development resources, and the unavailability of a cadre of substitute teachers for release time" (p. 37). A working document from Manitoba Education 2002 (cited in Wallin and Reimer, 2008) presented the argument that improving professional learn-

ing opportunities for rural teachers was critical for student success. Teachers across northern Canada frequently have to travel long distances and pay a great deal of money to participate in professional development, or school districts have to pay large consulting fees to bring speakers to professional development events. Certainly, technology has played a strong role in the last few years but the delivery models are often designed for urban centres with state-of-the-art facilities or a strong infrastructure to support such endeavours. Northern districts rarely possess such state-of-the-art facilities or personnel (McKeown, Noce, & Czerny, 2007).

Summerville and Johnson (2006) documented the implementation of a district-mandated, e-learning, professional development program in a rural, American, midwest school district. They found that educators who participated in e-learning experiences learned "how to use online collaborative tools to exchange ideas with peers" and that the continued use of these tools allowed these educators "to stay more up-to-date with the ever-changing world of education" (p. 357). Summerville and Johnson concluded that rural professionals in their study preferred e-learning choices for professional development over face-to-face models.

In Australia, Herrington and Herrington (2001) argued that Internet access to professional development could ameliorate much of the professional isolation experienced by rural professionals. They cautioned that infrastructure might be a consideration because rural organizations, such as school districts, must have the software and hardware to support electronic professional development; however, they also stressed that learners do not need access to state-of-the-art facilities or equipment to be successful in their professional development.

RESEARCH METHODS

The purpose of the present study was to investigate issues of supply and demand in four regions in northern Canada. We considered these issues: projected teacher shortages, the need for specialist teachers, and the nature of professional development.

Site

We recruited participating school districts by contacting school personnel in British Columbia, Alberta, Yukon, and Northwest Territories, focussing our research in areas above the semi-continuous permafrost line. Four school districts agreed to take part in our two-year study: Fort Nelson School District (British Columbia, five schools), Fort Vermilion School Division (Alberta, 15 schools), Yukon Department of Education (28 schools), and Yellowknife School District (eight schools).

Participants

There were 113 participants (96 teachers, 13 administrators, and one representative from each of the four Human Resources departments); 44 per cent were males (n = 50) and 56 per cent were females (n = 63). Fifty per cent of the teachers were between the ages of 26 and 35, 46per cent were over the age of 46, and four per cent were under the age of 25. Fifty-four teachers were from Yukon schools, six from Fort Nelson, British Columbia schools, 23 from Fort Vermilion, Alberta schools, and 13 from Yellowknife, North West Territories schools. Seventy-three per cent had taught at the same school from zero to five years. Sixty-nine per cent were kindergarten to grade 7 teachers, and 20 per cent of the grades 8 to 10 teachers taught either science and/or algebra. These demographic data were representative of the populations as reported by similar studies (e.g., Alberta Learning, 2003; BCPSEA, 2009).

Seven administrators were from Yukon schools, two from Fort Nelson schools, three from Fort Vermilion schools, and one from Yellowknife schools. Ten of the administrators were male with seven of the 13 administrators over 46 years of age. Eleven of the administrators had been at the same school between one and ten years; eight had been administrators between one and ten years. Two had been administrators for more than 20 years.

DATA COLLECTION

We used mixed-methods for our research design: an on-line questionnaire that included open- and close-ended questions, face-to-face and telephone interviews, and researcher field notes.

On-line Questionnaire

We sent the on-line questionnaire to all school district employees in the four research sites through the teacher association e-mail list (BC, AB, and NWT) and through the territory e-mail list (YK). We developed separate questionnaires for each participant group: teachers, administrators, and human resources personnel, requesting that participants complete the questionnaire within three weeks of receiving the invitation. The on-line questionnaires provided (a) the convenience of a broad geographical sample, (b) rapid data collection, (c) allowance for time necessary to complete the survey over three weeks, (d) ease of collection of follow-up contact information for interviews, (e) ability to target a specific population, (f) confidentiality, and (g) ease of data conversion for statistical analysis (Couper, 2008; Rea & Parker, 2005).

In designing the on-line questionnaires, we integrated issues raised in the professional literature into the questions. For example, we used a 10-point Likert scale for questions such as reasons for staying in northern school districts, (Please rank 1 as lowest, 10 is highest in response to the following statement: *I choose to stay where I am because . . ., [I love where I teach]; [I receive a good salary]; [I know that finding employment further south would be difficult]).* These stems incorporated aspects from previous studies on retention (e.g., Alberta Learning, 2003; Malloy & Allen, 2007). We also allowed for open-ended responses in which respondents could complete text boxes to clarify or augment their ratings.

Two criteria provided a base for our questions: (a) inclusion in the research literature and (b) allowing individual responses to support our research foci. The following items provide an example:

- *For the subject areas listed above, are you teaching outside of your area of expertise?*
- *Which of the following would best meet your professional development needs?*
- *What are your reasons for staying in rural communities (e.g., Please rank (1 is lowest; 10 is highest) the following in response to the statement: I choose to stay where I am because . . .).*

There were separate questionnaires for teachers, administrators, and Human Resources employees. This differentiation allowed for common questions and expertise-specific sections.

Interviews

We conducted the face-to-face and telephone interviews over two months; they occurred one month after the completion of the on-line questionnaires. The interviewees were self-selected because they volunteered their willingness to become involved and they included their contact information at the end of the on-line questionnaire. In total, we interviewed 19 participants out of 26 who volunteered (10 teachers, five administrators, and four Human Resources personnel), who represented 17 separate communities from across the four research sites. Of the seven who were not interviewed, two moved to other provinces or territories after giving consent, one could not be interviewed due to illness, and four could not be interviewed because their phone lines were down for two weeks. We interviewed some teachers and administrators more than once because we invited them to contact us if they wanted to discuss further issues that came up in the interviews. Questions were generally related to specific responses on the questionnaire:

You indicated that blended learning was your preferred professional development model. Tell us more about why you believe that it is the best model.

On the questionnaire, you stated that you strongly agreed that a reason for staying was related to how quickly and easily you could be promoted. Give me more details on why you strongly agreed with that statement.

I noticed that you stated on the questionnaire that career advancement was a major reason for staying in your community. Expand on that notion, please.

Tell me why you have chosen to teach outside of your area of expertise and tell me which subjects you have been teaching without the necessary expertise.

We also included non-questionnaire-related questions such as, *"If I were a fly on the wall at your recruitment session (or job interview), what would I hear from the interviewer?"* This type of question allowed us to gain better insight into the recruitment practices of the interviewing school districts. In total, we conducted 27 interviews with teachers, principals, superintendents, and human resources personnel (12 face-to-face and 15 telephone interviews).

Researcher Field Notes

We kept researcher field notes throughout the two-year study in which each of us recorded notes on trends, informal discussions between the two researchers, brainstorming sessions, and so forth. For instance, when we conducted face-to-face interviews rather than telephone interviews, one of us kept notes in addition to the recorded comments. In total, we recorded over 30 pages of notes.

Data Analysis

The data analysis occurred in two stages. In the first stage, we performed a frequency count of all responses in the on-line questionnaire to formulate interview questions. In this way, we saw the percentages of respondents, pooled and separated by teacher, administrator, and Human Resources groups, who chose specific responses to the statements. These data, useful for asking questions in the next stage of data collection, were used for statistical analysis in the last stage of data collection and analysis.

The second stage was a qualitative analysis of the transcribed interviews using NVivo 8 to examine nodes and relationships between and among respondents. Nodes are themes or topics that can be opened in individual files or extracted from a whole data batch so that only one theme or topic is shown for all participant comments. Relationships allowed us to find connections between nodes or between participants. In our data, for example, we could examine how respondents of a certain age females (age node) responded to why they stayed in their communities (staying node). A specific example outlines how we analyzed the interview data. One female participant indicated that she "*taught high school math in her school even though [she] was not remotely qualified*" (teacher, interview). We coded this sentence as "female" (gender node) and "teaching outside of expertise" (expertise node) and "qualified" (qualifications node).

FINDINGS

From the previously described mixed-method analysis, we identified five distinct topics from the on-line questionnaires, interviews, and researcher field notes. The topics provided insight into issues facing pro-

fessional educators in British Columbia, Alberta, Yukon, and the Northwest Territories. The first two topics focus on subject area teaching: the first on anticipated subject area teacher shortages in participating elementary and secondary schools; the second on how often teachers were expected to teach outside their areas of expertise. The third topic, which outlines current practices for recruitment of northern professionals, describes some successful methods for recruitment used by the districts represented in this study. The fourth topic, which describes the participants' reasons for staying in northern districts, demonstrates the importance of incentives beyond financial rewards. The final topic, professional development of northern educators, presents findings to show the potential of e-professional development. We discuss each topic in detail using direct quotations from the questionnaire and interview data.

Subject Area Needs

Administrators and human resources personnel identified distinct subject areas that had acute (i. e., needed right now) or chronic (i.e., needed every year) needs. All four school jurisdictions experienced acute need for elementary teachers in the following areas (in descending order): Learning Assistance, First Nation Language and Culture, Behaviour Support, Counselling, and Music; and secondary teachers in Industrial Arts, Home Economics, Business Education, and Technology Education. They indicated chronic need for elementary and secondary teachers in Behaviour Support, Learning Assistance, Resource Room, French, First Nation Language and Culture, Counselling, and Music.

The interview data provided more similar results. For instance, one administrator indicated that he thought *"more teachers were needed in all aspects of high school math and science but it is actually the shop and Business Ed teachers who are in high demand"* (principal, Yukon). A teacher stated that *"our school district has been looking for a Learning Assistance teacher for three years in a row but have always been unsuccessful"* (teacher, Northwest Territories). A Human Resources representative pointed out that *"any qualified Special Education teacher, in elementary or secondary, is desperately needed here as are First Nation Language and Culture teachers and Music teachers"* (Human Resources person, British Columbia).

Teaching Outside One's Expertise

In our survey, we asked administrators and human resources personnel to indicate their level of concern for teachers teaching outside their areas of expertise by subject area (1 = No concern to 4 = A great deal of concern). Seven out of the 10 administrator respondents were concerned that Learning Assistance teachers were not qualified. Similarly, they expressed concern for the following teaching areas: Resource Room, Algebra, French, History, Additional Second Language, Industrial Arts, and Music. Human Resources personnel expressed similar concerns. Three of the four Human Resources respondents indicated their concern about teachers working outside their areas of expertise in Learning Assistance, Resource Room, Music, French, Physics, Industrial Arts, Home Economics, principalship, and vice principalship; two were concerned in the areas of Physical Education, Chemistry, Algebra, Calculus, Tech Ed, Business Ed, English as an Additional or Second Language, and Librarian.

All 19 interviewees (10 teachers, five administrators, and four Human Resources personnel) elaborated on their concerns about teaching outside their areas of expertise. For instance, one teacher mentioned that she had *"taught seven [of eleven] courses in the last four years without being remotely qualified to teach any of them […but had] taught [herself] the content as [she] went along"* (teacher, Alberta). Other teachers, administrators, and Human Resources employees outlined concerns:

In my school, I tell teachers that they can expect to teach at least one course in secondary and one subject in elementary for which they have little to no expertise . . . which is done out of necessity when you are in the North. (administrator, Yukon)

We find that most teachers are willing to teach outside of their subject areas when they come to the school division but some are shocked at how far they are out of their expertise areas. (Human Resources person, Northwest Territories)

I trained as a Woodwork teacher and really thought that I would be in high demand when I got here but ended up teaching kindergarten on the first day of school! (teacher, Alberta)

I have taught high school subjects for the last few years but I trained as an elementary teacher. So, yes, I am concerned that I am teaching outside of my expertise. (teacher, Yukon)

Yes, some teachers are asked to teach courses without any training in the subject and yes, as an administrator, I am concerned with that state of affairs. Until we can get more qualified teachers, we just have to make do with the great teachers that we have. (principal, Alberta)

Recruitment

The questionnaire and interview data provided valuable information about the recruitment of northern educators. The questionnaire contained questions on strategies for recruitment and retention. The administrators and hiring personnel (13 administrators and representatives from four Human Resources departments) indicated that their respective school districts used a variety of methods to recruit teachers to their districts from advertising in national newspapers (11 of the 17 respondents) and district websites (9 respondents) to attending recruitments fairs in major cities (6 respondents). Incentives for recruitment and retention included Pro-D opportunities (9 respondents), higher increments after several years (7 respondents), higher than average salaries (4 respondents), subsidized housing (4 respondents) and opportunities for advancement (3 respondents). Of particular note, the Yukon Department of Education offers one-time financial incentives for teachers to come to the Yukon, which increases when a teacher agrees to move to more remote communities.

Interviewees outlined clear recruitment strategies. Seventeen of the 19 respondents mentioned some sort of financial incentive for coming to northern school districts. For instance, one person reported that

When I first came to the division, you received both a tax incentive and a large moving allowance that was given to you up front to use as you saw fit…. [now] there is a nominal amount, 200 or 300 bucks, to move here. Why can we not go back to that sort of incentive? (teacher, Alberta)

Other interviewees indicated additional ideas to recruit teachers to northern areas:

A signing bonus would be a great recruitment strategy for me and younger teachers. (teacher, Northwest Territories)

giving new teachers, say $500, for professional development or teaching resources (teacher, Yukon);

paying off a small to medium percentage of student loans for new teachers (teacher, British Columbia);

I would like to see some sort of incentive where every new teacher gets a new piece of technology for their class [like] a computer or scanner. (administrator, Alberta)

Reasons for Staying

Northern professionals have many reasons for staying both in their communities and in their jobs. In this study, to further develop reasons for staying in northern districts, we asked the 113 respondents to rank statements of agreement (1= *lowest* to 10 = *highest*). The top 10 reasons for staying were (a) I love where I work (66%), (b) good salary (58%), (c) integrated into the community (53%), (d) bought a house here (53%), (e) retiring here (41%), (f) cost of living is reasonable (38%), (g) opportunities for career advancement (37%), (h) employment is difficult in the south (35%), (i) access to teaching resources (34%), and (j) access to professional development (31%).

Many interviewees clarified reasons for staying in northern communities with such comments as:

I stay because I love being an administrator here since the staff are dedicated to their students [and] I probably would not have been promoted to principal so quickly down south. (principal, Yukon)

Sure, I get paid well but I love the challenges and opportunities where I work. (teacher, British Columbia)

If [this school district] could offer more money on the grid as we progressed, we would stay longer. (teacher, British Columbia)

When I first came here, I thought that I would be gone in a year or so [but] I quickly became a part of the community and the wonderful people here embraced me. I'll never leave now! (teacher, Alberta).

Additionally, almost half the 19 interviewees (n = 9) made statements such as *"with the porting of seniority [bringing seniority accrued in northern school districts to any new districts], I'm often tempted to move down south for the same amount of money and lots more resources [but] I stay for other reasons"* (teacher, British Columbia), or *"sometimes, I want to move further south for a multitude of reasons but I do like it here"* (administrator, Yukon), and *"with my Science background, I could work in the Edmonton or Calgary areas but I have a wife and family now here in [this community]"* (teacher, Northwest Territories). In other words, respondents appear to stay in these northern communities because they (a) have a sense of belonging, (b) are dedicated to their students and the community, and (c) see the potential for promotion faster in northern districts than in more urban locales.

Professional Development

Respondents completing the survey were asked to indicate whether or not their professional needs were met and what models met their needs. Sixty-six per cent of the respondents indicated that their professional development needs were being met while 34 per cent indicated their needs were not being met (significant at $\alpha < 0.01$). We also asked them to rank order their preferred professional development model. The questionnaire data indicated that a blended learning, professional development model[1] was chosen by 24 per cent of teachers, 38 per cent of administrators, and 100 per cent of hiring personnel, or by 24 per cent of all respondents (n = 113). All respondents chose other professional development models: (a) using local professionals (22%), (b) bringing in prominent speakers (15%), (c) taking on-line professional development (13%), and (d) inviting university professors (10%).

The interviewees reported that their professional development needs were met and that they had a preferred professional development mod-

[1] A blended learning professional development model is defined as one in which at least 50 per cent of the delivery is on-line.

el. They indicated that they often preferred to go to conferences out of town, province, or territory; however, more and more districts were requiring them to give back to their peers in the form of in-school or district-wide professional development workshops, a practice that added accountability from the school district and some pressure to perform for the teachers. One respondent's comment encapsulates many responses from the interviewees:

*A few years ago, going to a conference was a bit of a holiday and, to be honest, many teachers attended one or two workshops over the week. . . . Now, we are required to give workshops within a year of returning which puts so much pressure on you to take tons of notes to share when you get back! (*teacher, British Columbia).

Many agreed (n = 15) that a blended learning format to honour the community-university partnership through shared goals and staggered sessions would be much more preferable to their present models where a teacher either went away to a conference or a presenter came to the school but there was no follow up. Administrators reported that they saw a blended learning, professional development model as *"more bang for the buck"* (administrator, Alberta). In other words, all stakeholder groups (teachers, administrators, and Human Resources personnel) reported blended learning as the highest-ranked professional model compared with bringing in prominent speakers, using district personnel or local university professors, taking on-line courses, or participating in webcast sessions.

DISCUSSION

Our study confirmed many findings from the professional literature.

1. Our results support earlier studies on subject area teaching that found definite needs in high school sciences and mathematics, Special Education, second languages, Business Education, trades courses, and First Nation Language and Culture (Alberta Learning, 2003; BCPSEA, 2009; Echols, Grimmett, & Kitchenham, 1999; Grimmett & Echols, 2000; Kitchenham, 2001; Nova Scotia Department of Education, 2007; Tremblay, 1997).

2. We found consistency with studies that examined rural educators teaching outside their areas of expertise (Grimmett & Echols, 2000; Hannum, Irvin, Banks, & Farmer, 2009; Wallin & Reimer, 2008).
3. The present study's findings on recruitment are consistent with others that reported financial incentives to encourage teachers to come to rural communities (Alberta Learning, 2003).
4. Our findings support those of other studies that found teachers who stayed in their communities because they enjoyed their work (Kitchenham, 2001) had a clear connection to place and community (Corbett, 2009), and had access to professional development (Alberta Learning, 2003).
5. Findings of the present study are consistent with those who argue that e-learning is a preferred professional development method (Summerville & Johnson, 2006) and could lessen the isolation felt by rural educators (Herrington & Herrington, 2001).

Subject Area Needs

Our data support the research of others on the need for teachers in specific subject areas studies (Canadian Teachers' Federation, 2000; Echols, Grimmett, & Kitchenham, 1999; Grimmett & Echols, 2000; Kitchenham, 2001). In particular, the questionnaire results demonstrate a chronic need for secondary teachers in Algebra, Physics, Calculus, Bio-logy, Economics, French, Second Language (other than French), Behaviour Support, Learning Assistance, and Resource Room. Because we conducted our research approximately a decade after Grimmett and Echols (2000) and Kitchenham (2001), it would appear that little has changed in British Columbia; in addition, our research confirmed similar needs in Yukon, Northwest Territories, and Northern Alberta.

Our questionnaire data demonstrate that the four school districts do not have enough specialist teachers, a finding consistent with the Canadian Teachers' Federation's (2000) study that reported high school Science, Chemistry, Biology, and Physics teachers were in high demand in British Columbia and Alberta. Additionally, our data demonstrate similar findings to Grimmett and Echols' (2000) study that found teacher shortages in Business Education, French, Home Economics, Mathematics and Science, and Special Education (elementary and secondary); how-

ever, our northern respondents did not confirm Grimmett and Echols' (2000) finding of a shortage of generalist elementary teachers. As well, like Alberta Learning (2003), we found that the same shortages existed in technology education, junior and senior high French, Aboriginal languages, Special Education, and Business Education.

Outside One's Expertise

As part of the questionnaire responses, teachers were asked how often they taught outside their areas of expertise, and administrators and hiring personnel were asked to indicate how often they placed teachers in teaching assignments that were outside their areas of expertise. Twenty-seven per cent of the teachers indicated that they were teaching outside their areas of expertise. All 13 administrators and all four of the hiring personnel reported that they needed to place teachers *"less than 50 per cent of the time"* in subjects for which the teachers were not qualified. That statement means that more than half the time, the people in hiring positions placed teachers in positions for which they possessed clear qualifications for teaching the courses. In other words, there appeared to be a difference, as reported by the stakeholders, in interpretation as to either what teaching outside one's expertise meant or how often it occurred. This finding is consistent with Grimmett and Echols' (2000) interpretation that qualifications for specialty positions were being relaxed due to the shortage of qualified teachers. We also found that many teachers who teach outside their areas of expertise are less concerned about that fact than administrators and hiring personnel as reported in their interviews. This finding confirms the argument that rural teachers often view themselves as having wider skill sets than their urban counterparts and often have a teaching philosophy that reflects that need for specific skills dealing with special needs students (Wallin & Reimer, 2008). Additionally, our data are consistent with Hannum et al.'s (2009) finding that rural schools have a high percentage of teachers who teach outside their areas of expertise out of necessity.

Recruitment

Participants' responses to interview questions demonstrate that the need to provide incentives for teachers and administrators to come to and stay

in isolated communities without a large increase in financial obligations was a major factor. As one respondent reported, *"if [this school district] could offer more money on the grid as we progressed, we would stay longer"* (teacher, British Columbia). For instance, having a larger pay increment for fewer years of experience on the salary grid would be a clear incentive for some stakeholders to stay in their communities. In other words, increasing the increments between two and four years of experience and decreasing increments between seven and eight years of experience would encourage teachers and administrators to stay in their communities. This suggestion is consistent with Alberta Learning's (2003) finding that 85 per cent of respondents indicated that financial incentives for new teachers contingent on service commitment would be a clear incentive for recruitment of new teachers.

Reasons for Staying

The participants expressed passion about many aspects of being a northern professional in Canada. They reiterated that they enjoyed working in their present positions, a conclusion that is consistent with Kitchenham's (2001) conclusion that teachers stayed because they were content in their positions; however, the teachers in the present study were often tempted to move to a southern district to be closer to many amenities but made conscious decisions to stay. Many stressed that they realized that their career advancement was faster in their present locations and that they were well paid for their work, a finding, incidentally, which confirmed the reasoning behind programs for teacher retention in the United Kingdom and New Zealand (Kitchenham, 2001) that emphasized the importance of reasonable pay and rapid career advancement in rural and northern communities.

Professional Development

The questionnaire and interview data showed that those who engaged in professional development and those in charge of professional development saw that benefits to blended learning as the preferred professional development model. That is, the largest per cent (24 per cent) of teachers, administrators, and Human Resources personnel indicated that blended learning was their first choice in preference to using local professionals,

bringing in prominent speakers, taking on-line professional development, or inviting university professors.

This finding is consistent with both Summerville and Johnson (2006) that rural teachers in a midwestern United States school district preferred e-learning professional development opportunities and Herrington and Herrington's (2001) argument that online professional development with its access to video and multimedia capabilities and document delivery could lessen the isolation experienced by rural professionals.

SUMMARY

Our study provides a snapshot of teacher supply and demand needs and issues in northern British Columbia, Alberta, Northwest Territories, and Yukon. Through the use of an on-line questionnaire (n=113) and semi-structured interviews (n=19 interviewees [10 teachers, five administrators, and four Human Resources personnel, we addressed three research purposes: (a) to ascertain in which subject areas there existed acute and chronic needs for teachers; (b) to investigate existing recruitment and retention methods for rural professionals; and (c) to ascertain preferred professional development models.

The findings indicate that participating school districts struggled to provide qualified teachers in high-demand subject areas such as high school mathematics and science and in elementary Special Education; however, many schools coped with the need by requesting teachers to teach outside their own expertise. Our data also demonstrate that there were few incentives for teachers to move from urban areas to northern school districts beyond slightly higher salaries and opportunities for career advancements. Few innovative recruitment practices existed; most administrators and other hiring personnel reported that they still use major newspapers and job fairs in large urban areas as common recruitment practices. In our study, the one exception was the Yukon Department of Education which provided a small stipend for teachers to come to the territory, which increased when a teacher moved to a more isolated community. Lastly, to address both acute and chronic teacher shortages in specialized subject areas and educators teaching outside their expertise, school districts used professional development opportunities. The professional development model selected by the most partici-

pants (24%) was blended learning. Additionally, the administrators and hiring personnel reported that blended learning was the most sound professional development model when considering the teachers' overall learning, transference to the classroom of skills and strategies, and cost efficiency.

CONCLUSION

Implications derived from the data offer a partial road map to enhance the learning situations for students in northern schools through two main findings based on data from the 56 schools represented in this study: the definite need for specialist teachers and the number of teachers required to teach outside their areas of expertise. It is likely that recruitment and retention issues, including attracting specialist teachers, will continue to affect school districts in northern isolated communities. In this study, the respondents suggested concrete strategies for recruitment of new teachers which included (a) signing bonuses, (b) increasing pay increments at the lower end of the salary grid, (c) moving allowances, (d) professional development funds, and (e) paying off a percentage of student loans. These suggestions would require an intense level of negotiation at the various levels of bureaucracy.

We acknowledge that these findings are tentative and time specific because many contextual factors such as changing economies, varying demographics, and government changes, which are outside the scope of the present research, could have an impact on future findings in the North and elsewhere. Professional development that identifies, through consultation and collaboration, the specific requirements of these communities is preferred. The qualifications of teachers in these communities, including those teaching out their areas of expertise, can be enhanced through a professional development delivery model that recognizes the isolation of the community, the strengths of particular delivery models, and the benefits of community-university partnerships (Kitchenham, 2008, 2009). If teachers continue to teach outside their areas of expertise to address the chronic need for specialist teachers, professional development models need to be better designed to utilize Web 2.0 technologies (Alberta Learning, 2003; Herrington & Herrington, 2001).

Administrators may find that the results of this study will help them to make decisions about the types of professional development activities that best suit their district's needs and that teachers under their supervision would embrace. Many districts offer professional development activities as incentives for retention, and teachers indicated that one factor in choosing to remain was the districts' providing these professional development activities, and often paying their cost. Human Resources personnel believed that these types of professional development activities would be most cost-effective for their districts even if infrastructure needed to be strengthened. In short, blended learning professional development would work well for teachers, administrators, and school districts.

This research addressed the concerns of northern professionals whose needs are often forgotten due to their distance from policymakers. Meeting the needs of the northern educators is paramount to us as researchers. The technological aspect of this project will also be important because the delivery models for meeting northern residents' needs will require various technologies. Lastly, by forming partnerships with government departments and school districts, we expect that this research will be continued beyond the initial development stage through our expanded capacity to conduct research in the North.

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