Literacy Achievement in Small Grade 1 Classes in High-Poverty Environments

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We explored the influence of three interventions on the literacy achievement of grade-1 students in 10 schools in high poverty environments: small class size, a focus on literacy, and teachers' continuing professional development. Despite the short-term nature of the project, the students made noteworthy gains in reading and writing, as measured on test scores. In interviews, teachers, principals, students, and parents described not only the general advantages of small classes, but also the additional benefits accruing from an instructional focus on literacy and from teachers' continuing professional development.

La recherche porte sur l'influence de trois facteurs sur les résultats en alphabétisation d'élèves de première année dans dix écoles de quartiers défavorisés : petite classe, accent sur l'alphabétisation et perfectionnement professionnel des enseignants. En dépit de la courte durée du projet, les élèves ont fait des progrès remarquables en lecture et en écriture, comme en témoignent les notes obtenues. Au cours d'entrevues, les enseignants, les directeurs d'école, les élèves et les parents ont décrit non seulement les avantages liés aux petites classes, mais aussi les bienfaits dérivés de l'accent mis sur l'alphabétisation et de la formation professionnelle continue des enseignants.

Many young children begin school "ready to learn." By kindergarten, they have been exposed to the alphabet, books, and numbers. They have been introduced to problem-solving techniques, and they have developed the social skills to function successfully within group settings. This readiness for school provides a base on which teachers can build in both academic and social areas. Doherty (1997) outlines five components of school readiness: physical well-being and motor development, social knowledge and competence, emotional health and a positive approach to new experiences, language skills, and general knowledge and cognitive skills. She suggests that children who come to school without these components risk failure as soon as they start school. Morrongiello (1999) points out that "school readiness at age six predicts children's academic success in

the early school years and this in turn predicts the likelihood of children completing high school" (p. 7). Children entering schools in high-poverty, high-transiency environments are more likely to lack school readiness. Despite extra support from teachers, many of these students are not successful in school.

PURPOSE OF THE STUDY

The purpose of this research was to explore ways to enhance academic achievement, especially literacy development, for students from low-socio-economic backgrounds. Specifically, we examined the impact of three interventions — small class size, a focus on literacy, and continuing professional development — on the growth and achievement of grade-1 students in 10 Edmonton public schools in high-poverty, high-transiency environments.

FACTORS AFFECTING THE LITERACY ACHIEVEMENT OF MINORITY AND INNER-CITY CHILDREN

Banks and Banks (1995) have reviewed research on specific issues associated with minority and inner-city children in low socio-economic settings. In general, their work has been from a deprivation orientation; in other words, the home lacks sufficient appropriate literacy experiences. This line of research places blame for low literacy achievement on inadequate language and literacy experiences in the home. Statistically, a correlation exists between family income and a child's language development (Human Resources and Development Canada & Statistics Canada, 1996), but most researchers agree that poor home experiences do not account for the extent of failure experienced by children from high-poverty settings. Research from a cultural difference orientation (Au, 1998; Heath, 1983) suggests that children from low socio-economic settings bring a variety of literacy experiences from their homes, and often have parents who value literacy and are anxious to help their children succeed. However, these literacy experiences may not transfer easily from the home to school context (Taylor, Anderson, Au, & Raphael, 2000). As a result, teachers perceive that most literacy experiences for these children begin when they enter school.

Another factor affecting these children's literacy learning is resistance (Erickson, 1993). Resistance, the deliberate unwillingness to try to achieve, was previously thought to emerge in students in their junior-high or secondary-school years (Willis, 1977), but recent studies with children in

middle grades show that resistance begins earlier and may become entrenched about grade 5 (Leroy, 1999). Unable to keep up with school work, but anxious to retain the goodwill of teachers and administrators and relieve the stress of trying to achieve, the child copes by no longer attempting to learn. Experiences in the community may well provide support for believing in the non-utility of academic success and the lack of connection between the curriculum and the realities of the child's life. At the point of resistance, schooling becomes irrelevant for the child (Maeroff, 1998). In effect, the less children are engaged with the school, the less they are able to complete the tasks required and the lower their level of achievement; the lower their achievement level, the less they are able to complete the tasks, and the less involved they feel with school (Erickson, 1993).

Students who begin school with significant deficiencies in their background knowledge and skills have difficulty in achieving success in the early years of school (Madden, Slavin, Karweit, Dolan, & Wasik, 1993; McGill-Franzen & Allington, 1992). Further, those who experience failure in their early years have a greatly increased likelihood of continuing school failure, remedial programs, behavioral problems, and non-school completion. Ultimately, students who do not complete their schooling are at increased risk of developing problems in terms of employment and successful functioning in the community (Stanford, Offord, McLeod, Boyle, Byrne & Hall, 1994). One approach to help prevent this kind of negative spiral is the implementation of early intervention strategies, particularly from kindergarten to grade 3.

EARLY INTERVENTION STRATEGIES

One such early intervention strategy is to reduce class size. In the Project STAR study on small-class size (1985–1990), Finn and Achilles (1999) found that students in classes of fewer than 17 (and in particular minority children and those in schools in high-poverty neighbourhoods) had statistically significant achievement gains in all subject areas and at every level (K–3). Subsequent findings from the Wisconsin SAGE (Student Achievement Guarantee in Education) program showed similar gains in achievement for first-year children (Molnar, Smith, Zahorik, Palmer, Halbach & Ehrle, 1999). Based on an analysis of these and similar studies, Witte (2000) concluded that, despite their limitations, the studies provided evidence for "standardized test advantages for small classes" (p. 4), and that teachers continued to use the same approaches regardless of class size but with more individualization and fewer discipline problems.

Another early-years intervention strategy is to focus on literacy. There has been sustained and intensive research on effective literacy instruction (Taylor et al., 2000). Most of the research supports teachers' use of a variety of approaches based on their informed judgment in working with individual children (Au, 1998; Snow, Burns, & Griffin, 1998). The programs these and other scholars identified as effective for reading instruction involve some combination of individual- and small-group instruction, a combination of code (phonics) and meaning approaches, on-going and intensive individual assessment, and experience with a wide variety of reading materials (Center for the Improvement of Early Reading Achievement, 1998; National Reading Panel, 2000).

A third intervention strategy is teachers' continuous professional development which researchers have identified as an essential aspect of effective schooling. Because of the frequency of between-teacher rather than between-method variation, Taylor et al. (2000) concluded that "teacher professional development, stressed as an important key to improving students' reading achievement (Lyon, 1998; Snow et al., 1998), may be more realistic than finding the 'right' method" (p. 21). In the STAR project (Finn & Achilles, 1999), some teachers received an initial three-day inservice on classroom management, individualized instruction, and teaching higher-order thinking skills. Their students did no better on the achievement tests than did students of teachers without such training (Fogler & Breda, 1989). McRobbie (1996) suggested that staff development should be ongoing, school-based, and designed to develop a professional community where teachers share what works for particular students. Au and Carroll (1997) pointed out the benefits to be gained when collaborative professional development involving problem-solving and reflection occurs in tandem with the goal of literacy development. Yet Bohrnstedt and Stecher (1999), with reference to the California study on class-size reduction, noted that the issue of appropriate teacher professional development was largely unexplored.

STUDY DESIGN

We designed the study questions around these three interventions: reduced class size, a focus on literacy, and continuing professional development.

1. Did small classes enhance students' literacy achievement?
2. How important was teachers' continuing professional development in enhancing students' literacy achievement?
3. What was the influence of small classes on teachers' classroom practices?

The initial incentive for this Alberta government-funded project is

reflected in the first research question. The school board initiated a testing framework that provided individual student achievement data on a monthly basis.

The second question reflects the district's concern for early literacy acquisition. District personnel co-ordinated their own version of the Balanced / Early Literacy intervention program. The program, similar to that of Fountas and Pinnel (1996), contained components on words, reading, and writing. The word component included a word wall, making words, and sort and transfer; the reading component involved reading aloud, and shared, guided and independent reading; and the writing section included modeled, shared, guided and independent writing activities. At the beginning of our study, 11 teachers in the study were already attending the district's two-year, inservice program on balanced literacy. The others, either new to grade 1 or to the district, enrolled in a specifically designed Early Literacy series, a shorter version of the Balanced Literacy program.

Both programs consisted of a series of in-school inservices offered by the district consultants. Each session included a description of an effective strategy, practical suggestions for classroom use, video-taped examples, links to the Alberta Program of Studies, possible resources, and group discussion. A consultant observed the teachers in the Balanced Literacy program working with their children, and every month provided guided feedback and coaching. In keeping with the recommendations of the program, the teachers spent their mornings on the language arts curriculum.

The third question reflects our interest in actual changes in teachers' practices that might result from the small class size and the focus on literacy development. Teachers who move to small classes tend to go from a large, whole-class orientation to a small whole-class orientation, with one-on-one remediation (Betts & Shkolnik, 1999; Rice, 1999; Zahorik, 1999; Zahorik, Molnar, Ehrle, & Halbach, 2000). We wondered how the district's inservice programs and teachers' reflections on their teaching would change their practices. The teachers met with us in monthly three-hour meetings where they shared teaching ideas and materials and reflected on their daily classroom experiences.

THE GRADE-1 CLASSES

The study, which ran from January to June 2000, began with the creation of small classes of 15 or fewer students at the grade 1 level in 10 schools, chosen because they had the highest student transiency rates and the highest percentage of families in the district living below Statistics Canada's

Low Income Cut-Off. Of the schools, five were almost a century old, with the most modern school opened in 1966. All had small enrolments (95–270). Transiency rates were over 30%. Five were K–9 and five were K–6 schools, and four were designated sites for special needs programs. In January, class size was reduced from a September enrolment of 19–27 to 9–15 students. In all, 17 grade-1 classes were formed. Enrolment was about 207 students but with transiency, only 161 students took both the January and May tests. Children in these classes were predominantly from First Nations or South Asian backgrounds. On average, two students in each class were designated ESL students and received extra instruction from a reading teacher. Most classes included at least one special needs child with specified funding. Schools decided on the student groupings and staffing for the grade-1 classes. Of the 17 (16 female, 1 male) teachers, most had previously taught grade 1, and, while 2 had only been interns, 10 had over 10 years' experience. Twelve teachers were on permanent staff; 5 were newly hired. The study by university researchers was a condition of funding.

DATA SOURCES

We used three major data sources: test results, individual interviews with teachers in their classrooms, and monthly group sessions with the teachers.

Testing Protocols

The district annually administers two measures, a writing component and a reading comprehension test, to all elementary children using what it calls the Highest Level of Achievement Tests (HLAT). The writing component is administered each year at the end of April and the reading test at the beginning of May. The reading test is the reading comprehension component of the Canadian Test of Basic Skills (CTBS). In this test, students read a passage and respond to questions about it. For HLAT reading comparisons, rather than use the publisher's norms, the district uses already-established scores to determine a student's grade level for reading ability based on a standard-setting procedure which involved the district's teachers. The writing test is a locally developed measure designed to provide students with the opportunity to demonstrate their achievement relative to the graded curriculum in language arts. A common writing prompt is used. The tests are scored against district norms, pre-set by trained teachers and district reading consultants. The district has developed a guide for evaluating writing to ensure consistency in scoring, and each

test is scored by two different readers. Two marks are allocated: grade-level achieved and the level of proficiency (limited, adequate, proficient, or excellent performance). The district did not have mid-year test data available to allow us to compare the impact of these interventions against previous years' data.

We obtained additional information about individual reading skills from the Developmental Reading Assessment (DRA), a one-on-one student assessment administered by a reading specialist. A primary benefit of the DRA is the one-on-one conference that permitted teachers to observe and interact with students, and to record their responses and behaviours as they read and responded to the texts. Although the tool is primarily diagnostic, it provides a reader's independent reading level based on word accuracy while reading.

Test administration followed the schedule laid out in Table 1.

Individual Interviews and Group Sessions

The research team gathered information on the social and pedagogical impact of small class size and the influence of professional development through 60–90 minute audio-taped interviews with teachers in their classrooms in February and June and through the monthly three-hour group sessions which we also audio-taped. In the interviews, we asked teachers to describe their experiences with their small classes, to compare them with previous large-class sizes where appropriate, to describe perceived effects, and to discuss their own teaching philosophy. The teachers used the interviews as an opportunity to share students' work, to point out how their teaching occurred, and to document changes in their own learning.

In the monthly sessions, we asked teachers to discuss whether the small-class size had brought about any changes in their teaching. Otherwise, they set the agenda. Teachers brought samples of students' work, discussed how various strategies had worked for them, and sought the advice of colleagues. The group included many highly accomplished and experienced teachers. They prized problem-solving, collaborative learning and learner understanding, and described many examples of what they did and why, where students might have difficulty, and what to do next. Some teachers had extensive experience in understanding the children's background situations and provided advice about appropriate handling of cultural issues and interpersonal situations with parents and children. Once trust had been developed, the group proved to be particularly rich in ideas, and teachers were comfortable questioning their routines and

seeking advice about alternatives. All teachers were invited to document literacy development in a student of their choice and share these profiles with the group. In addition, we interviewed 10 principals, 12 parents, and 21 students about their experiences with small classes.

District staff analyzed the student test data and prepared summary

TABLE 1

Test Administration and Scoring Timetable

Month	Test	Scoring
January, 2000	Specially administered HLAT Part 1: CTBS Level 6 Form K for kindergarten to mid-grade 1	Scores converted to percentile ranks by district staff.
	Specially administered HLAT Part 2: Common writing prompt	Marked by trained classroom teachers following protocol.
February	Developmental Reading Assessment (DRA)	Administered and scored by district specialists. Results returned in early March.
March-April	Easter vacation	
	District-wide HLAT Part 1: CTBS Level 7 Form K for mid-grade 1 to mid-grade 2.	Raw scores converted to percentile ranks.
May	District-wide HLAT Part 2: Common writing prompt	Marked by trained classroom teachers following protocol.
June	Additional Common writing prompt (HLAT) after maximum time in small classes	Marked by trained classroom teachers following protocol.
	Developmental Reading Assessment (DRA)	Scored by study teachers following training by the consultants.

tables. The research team analyzed the data from the interviews, observations, group meetings, case studies, and instructional materials. The qualitative data sources proved to be rich and iterative. Stories of occurrences in their classrooms, which teachers related at the group meetings, often built on information provided in the initial interviews and were substantiated in following meetings. The research team first coded and then categorized the transcribed audiotaped data. We established trustworthiness among researchers through congruency in coding. Teachers replicated descriptions of their classroom activities in the materials they shared. They demonstrated their orientations in their cases: the instructional materials they brought, the stories of practice they shared, and the advice they gave. Parents and principals told stories that also corroborated the teachers' descriptions.

CONSTRAINTS ON THE FINDINGS

Because of the timing of the funding and the initiation of the project during December holidays, schools had to hire teachers, reorganize classes, reassign students, and find sufficient space and equipment for school opening in January. The subsequent research design had to complement these parameters and work within the testing decisions of our school district partners. These realities placed the following constraints on the findings.

The intervention period was relatively brief, implemented mid-year. Providing an alternative, small class in January implied an adjustment period for students and teachers alike. In half the classes, the activities that teachers engaged in at the beginning of the school year — setting expectations, developing routines with the children, assessing the children's abilities, learning about the children's backgrounds — had to begin again. Also, because some of the comparative assessments were undertaken as early as late April, the gains made by these students were based on an intervention period of only four or five months. In addition, the inclusion of a year-round school meant that those students were on holidays for a month during the project.

The testing instruments had limitations in measuring student growth. The test instruments employed in the study were those used in the district's annual assessment of student achievement. Using the same instruments meant that teachers were familiar with the test format, and the students would only have to write one set of tests in May. In addition, the need to administer a test set in early January in all 17 classes militated against an extended exploration of alternatives by the district testing centre. Ironically,

most of the teachers involved in the study complained that the testing procedures did not fit their coaching strategies for student success, and the vocabulary and content used were foreign in their students' lives.

Literacy acquisition is a long-term, developmental process. Student development is holistic and requires a much longer period than the six months of this study. Many of the student achievements about which teachers were most pleased were made by students who still did not rate as achieving grade-1 literacy. Nonetheless, the teachers saw these achievements as foundational in helping establish motivational and behavioural patterns that would support learning over the long term.

> Some of the children coming into grade 1 at [our] school have never attended kindergarten, and many of them have never even read a book. They've never seen a book; they've never been read to. So they come in lacking really basic skills; for us to make a grade level gain with these kids, that's huge growth! (principal)

FINDINGS

We have based the following findings on the quantitative and qualitative data collected during the six-month study. Although we have reported the data separately, we believe the combination of all three interventions contributed to the overall goal of student academic and social growth.

The Impact of Small-Class Size on Literacy Achievement

We assessed literacy development through student scores on a variety of monthly tests: for reading, the Canadian Test of Basic Skills, and the Developmental Reading Assessment, and for writing, the district's Highest Level of Achievement writing prompt.

Students' scores on the Canadian Test of Basic Skills went from being predominantly clustered (77%) below the 50th percentile and especially in the first quartile (47.8%) of the scale to almost one half (45.4%) being above the 50th percentile four months later (Figure 1). The percentile rank of a student who is making normal progress would be expected to remain relatively constant between test administrations, and this was the case for 59 of the 161 students (36.6%). However, percentile rankings for 88 students (54.6%) increased over the four months, and for 42 students (26.1%) that change was by more than 30 percentile ranks. Thus, in spite of the typical challenges to achievement faced by inner city students, only 8.7% of these students received percentile scores in reading comprehension reflecting less than normal progress for their grade level. The expectation for a norm-

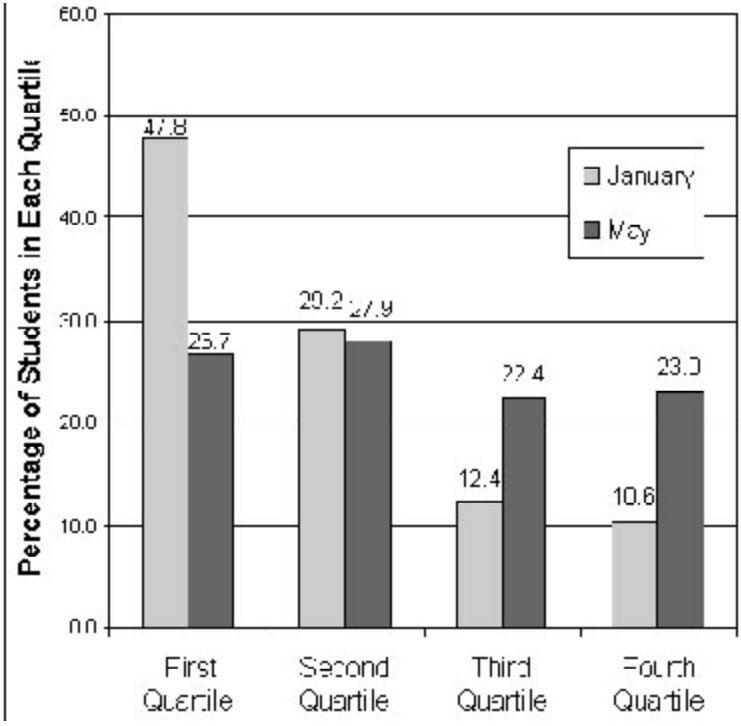

Figure 1. Distribution of percentile ranks from the January and April 2000 administration of CTBS reading comprehension subtest

referenced test such as CTBS is that students will be evenly represented in all four quartiles, and this was generally the case for this group of students by the end of the four months.

In January, only 16% of the students were assessed at a mid-grade 1 level or better on the Developmental Reading Assessment. By June, 71% of students were reading at or above mid-grade 1. Based on three administrations of the HLAT writing prompt (January, May, and June), approximately 80% of students were considered to be at or above grade-1 level by June.

Comparison Data

Because the school system administers the HLAT annually, we compared these students' results with scores from the previous year. In the district in general, the percentage of students achieving grade-level literacy fell

slightly; in the 10 schools in our study, the percentage of students reading and writing at grade level increased, but the percentage gain was not significant.

Overall, the reading and writing test results suggest that somewhere between 70% and 80% of the grade-1 children in the project were at or above the grade-1 level by the end of the year. Based on the January CTBS administration, only 23% of the grade-1 children had percentile ranks above 50. In May, 45% of students were above the 50th percentile. However, the most telling aspect was that, at the end of the study, these grade-1 children remained well below the district average as measured on these tests (71.3% vs. 84.7%). A concerted effort to focus on literacy development in small classes was of itself insufficient to demonstrate remarkable progress on these tests in four months. This observation is not surprising, given that such children have to learn more and faster to meet test requirements than their advantaged peers (Arroyo, Rhoad, & Drew, 1999). The intervention did, however, result in substantial gains in literacy development (even if not up to the grade-1 level), as evidenced by the teachers' multiple assessments.

Continuing Professional Development

How important was teachers' continuing professional development in enhancing students' literacy development? The Balanced Literacy and Early Literacy programs provided useful strategies and teachers gave us many examples and evidence of their use of all the aspects mentioned previously. One teacher commented that, even though she was familiar with many of the ideas, she appreciated "the spur of seeing it again and hearing what other people are doing. It's nice to have that collegiality among the teachers."

One obvious result from these sessions, heard in our group meetings, was teachers' development of a vocabulary to discuss literacy experiences and a repertoire of literacy processes to use in such situations. As a result of their training to administer the Developmental Reading Assessment, teachers said they were better able to assess and respond to student word recognition difficulties.

The teachers noted that the reflective sessions where they set the agenda for discussion were particularly important in giving them a feeling of support, and in energizing and sustaining them during the study. They commented on the richness of ideas learned from colleagues. One noted, "It's been such a pleasure and exciting and fun to be involved — to have the support of that once-a-month meeting to see what other people are

doing." Another added, "And just having somebody else interested in what you are doing in your classroom . . . And then to hear, 'Boy! That's a really great idea. Can I try that?' There's a lot of support in that." In reviewing the transcripts, we noted that, over time, teachers became more willing to share both problems and difficulties as well as stories of success and to engage in collaborative problem-solving (Haughey, Snart, & da Costa, 2002).

The professional development program had positive outcomes for teachers. They felt better informed about literacy-development strategies and increasingly comfortable with the approaches. They used these literacy-development strategies as markers for students' development and their own successes. Teachers observed, described, and documented many examples of students' accelerated growth. Over the sessions, they became more reflective and appreciative of the expertise among the group members. One teacher noted that "It slows it right down so we can go back and reflect on what's happening. That's very valuable and teachers so seldom get time for that kind of reflection and discussion with other teachers in the same situation."

The Influence of Class Size on Classroom Practices

All the teachers identified instructional benefits associated with small-class size. They mentioned the students' enhanced learning environment with less noise and fewer distractions. They reported that having more space meant that students could be active without disturbing others, resulting in better social interaction. In turn, teachers considered instructional alternatives to seatwork.

> It's more that I guide them through each activity, and then they take off on their own. So it's not so much that I'm telling them what to do and when to do it; they're in control of what they are doing now. Whereas before, if it were a large class, it would have to be a lot more regimented. (teacher)

Teachers shared stories of students' improved in-class behaviour, of greater caring for each other, and of less aggression because sufficient resources were available. They had less routine marking and record-keeping. Teachers described how they focused on the needs of individual children, tailoring learning to meet their specific requirements. A few teachers related how they had to deal with students who had become adept at "hiding" in a large class so they could avoid being held accountable for their learning. Some students' specific learning needs had not been

identified in the larger classes and consequently they had inappropriate learning and attention behaviours. Similarly, teachers did not identify some students' heightened abilities until class numbers were reduced.

In terms of curriculum and instruction, teachers moved from large-group or whole-class procedures that were designed to eliminate disciplinary issues to strategies that arose from the curricular intents for grade 1. Because they were able to accomplish more within the same time, they were less concerned about completing the curriculum and instead focused on diversification and elaboration of the curricular expectations. Teachers designed projects to enrich students' learning where reading, writing, and speaking were integrated in a literacy-rich environment.

Because they had smaller classes, the teachers began to integrate social, emotional, and academic goals. They used activity-based learning, especially in the sciences, an area that had received much less attention in their previous large grade-1 classes. They described sequences of oral and written work that went from students planning an activity, to discussing and then writing about it, to making their work into books, and then reading about their experiences. Over the course of the six months, the teachers changed and elaborated their instructional strategies and organizational structures.

Teachers' plans became at once more complex and more flexible. They found that they could provide an enriched curriculum with a greater variety of activities and grouping structures.

> I've grown in organizational skills and in creativity. I didn't think I was creative with my class of 30 because getting out things, hands on, doing wonderful, exciting experiments and things like that just didn't seem possible to me. I've become more of a risk-taker. I'm doing things I wouldn't have done before because of the management and the numbers. (teacher)

They saw themselves as more attuned to individual children and more able to respond directly to one student while coordinating the work of others. One said, "I can correct the errors right when they're happening. I don't have to wait and correct them after school and then go back over it. I can show them right away." Having more opportunities to work individually with children helped them become more aware of each child's personality and particular family circumstances. Even teachers who had been teaching in schools in high-poverty environments for some years felt they had learned anew about the issues for these families. In schools where there was more than one grade-1 class, the teachers usually discussed their practices and planned units and lessons together. One explained,

"It's just so good to have another teacher teaching the same level: that we can talk to each other about and plan similar things." Principals recognized these as mentorship opportunities and provided common planning times to facilitate this process.

Comments from Principals, Parents, and Students

Principals and parents, as well as teachers, saw the improvement in the children's attitude to school. One parent commented, "They feel so good about themselves that they try their best to please the teacher because the teacher gives them the attention." Principals noted that the students, much more than their counterparts in previous grade-1 classes, were excited about being in school. They spontaneously made more contact with the principal to show off their work. Principals spoke about observing the students' improved behaviour in class and on the playground. In classrooms, principals saw that children spent longer time on tasks and were better able to ignore extraneous noise than in the larger (19–29) grade-1 classes. On the playground, they found that the children were less aggressive in their reactions to other children and behaved more appropriately with their peers. Parents saw these behaviours transferred to the home: "I can't believe his improvements especially at home."

All 10 principals shared stories of improved student attendance. Principals linked the improved attendance and calmer classroom atmosphere to improved student behaviour and greater learning that had resulted from teachers' frequent focusing on individual children. Principals noted how teachers were more precise in describing a student's learning difficulties and more positive about how they could help a child achieve success. Parents stopped principals to express their appreciation for how their children were feeling, and how much they had achieved in the small class. The parents described how their children were taking home books and organizing older brothers or sisters to read to them.

Student interviews were a challenge. One child, given crayons and some paper, was then asked a question. "Hush, can't you see I'm working," was her immediate response. The children mentioned reduced noise, increased activities, and more teacher attention as contributing to their enjoyment of the small class. One concluded that now "You get lots of attention from the teacher," while another noted that the teacher "doesn't have to put up with as much."

Overall, the teachers, principals, and parents were able to readily identify positive behavioural changes and changes in students' attitudes that they attributed to the small-class size. They described children who wanted to

attend, who were excited and positive about learning, and who felt at home in the classroom setting. The teachers identified changes in their teaching practices such as more individual and small-group activities and field trips. One commented, "You don't have any less planning. You probably have more planning now, because you are individualizing for each child." Their own attitude towards teaching also changed as the time spent coping with the outcomes of large classes (noise, discipline, marking, seatwork) was replaced by active professional learning. The information from the principals, parents, and students supported what the teachers told us.

CONCLUSION

This study suggests that despite significant limitations, a combination of three interventions — smaller classes, a focus on literacy, and continued professional development — was successful in helping grade-1 students in high-poverty, high-transiency environments make solid gains in their academic and social abilities. We believe that the findings of this study support this combination of interventions.

The reduction in class size produced various benefits, many of which have been previously recognized by researchers — less noise, less overt discipline issues, more space and hence a greater sense of autonomy, and sufficient resources. These benefits resulted in better learning, improved student interaction, and positive social growth. But the combination of small-class size, professional development, and a focus on literacy provided teachers with the conditions for making optimum use of their expertise. We believe that small-class size alone was not sufficient; there also has to be a sustained emphasis on enhancing teachers' practices through professional development in the classroom and through discussion of these activities in the larger context of teachers' professional practical knowledge.

DISCUSSION

A short-term study of this nature has obvious shortcomings, but it is one of only two Canadian studies on class size. The earlier study (Shapson, Wright, Eason, & Fitzgerald, 1980), conducted in Toronto in 1977, investigated the effects of class size on teachers' expectations of the effects, and on grades 4 and 5 student achievement, among other process variables. Students were assigned to variable class sizes with 16 (now considered the maximum) being the smallest of the four groupings. The researchers found little difference in teachers' instructional practices or in student

achievement, but teachers reported differences in classroom management, physical layout, and student evaluation. Since then, there have been over 100 U.S. studies on class size (Finn & Achilles, 1999), but few have focused on actual changes to teacher practices. Fogler and Breda (1989) and Evertson and Randolph (1989) report similar findings about the inadequacy of short-term, three-day inservices to change teachers' beliefs about teaching practices, an understanding of professional development as an intervention, or even a form of remediation added on to the professional day. One implication of this study is that professional development should be an integral part of teachers' everyday professional practices.

Sustained changes to teacher practices are most often the outcome of teacher reflection on their deeply held beliefs. As McRobbie (1996) comments, "The weight of evidence indicates that when such changes don't accompany reduced class size, achievement gains are unlikely" (p. 3). However, Spillane and Jennings (1997) note that, even when teachers say they are using the same strategies, the actual practice can vary widely, and depends on teachers' prior understandings. We sought to make these situations the basis for discussion and reflection in the group meetings. Referred to in the literature as communities of practice, Hord (1997) considered these groups of teachers in similar teaching situations as the most likely catalyst for teacher change. However, we believe that it was the combination of professional development with immediate classroom impact and the structured opportunity to reflect, plus team planning and school staff discussions, that helped these teachers explore and change their practices. Such situations would benefit from long-term study.

Much remains to be learned about teaching children living in low socio-economic environments. High transiency rates (~30%) in these schools may be one factor limiting the development of these children's school readiness. Having children work at home with parents, siblings, or adult care-givers is considered essential in enhancing literacy development (Wang, Oates, & Weishew, 1995). Through discussion, the teachers in this study began to acquire a repertoire of successful home/school strategies, from open houses to family journals. They found that when students used materials that spoke positively of their own cultural heritage, not only the child but also the parents exhibited a more positive orientation to schooling. These areas, too, could benefit from further research. Although we did not find statistically significant test score gains in literacy achievement over the five months of the study, we found many instances of substantive student development that reflected remarkable literacy gains in these grade-1 students.

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