AN ACTION RESEARCH APPROACH TO IMPROVING STUDENT LEARNING USING PROVINCIAL TEST RESULTS

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Abstract

During the 1999/2000 school year, seventeen elementary school teachers and five consultants from two Ontario school boards, conducted action research based on the 1999 Education Quality and Accountability Office (EQAO) provincial test results for Grades 3 and 6 and the use of feedback/corrective action to improve those results. Paired with a "critical friend", individual teachers analyzed their schools' results and identified areas for improvement. They identified action research questions, investigated the questions in their own classrooms, collected data to evaluate the impact of their work, and recorded their investigations. The teachers' own assessments and the 2000 EQAO test results indicate substantial success. Teachers began to see provincial test results as friendly data that schools can use to improve student learning, and action research and feedback/corrective action as powerful methods to do so. The study contributes to understanding how provincial testing and action research can be used to improve student learning, what constitutes effective teacher in-service education, and the benefits of teacher research.

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AN ACTION RESEARCH APPROACH TO IMPROVING STUDENT LEARNING USING PROVINCIAL TEST RESULTS

Chapter 1 - Introduction

This research study involved teachers in two district school boards, one public and the other Catholic. Three partnering organizations worked collaboratively in conducting the study. The three were: Grand Erie District School Board, located in southern Ontario with offices in Brantford; Nipissing-Parry Sound Catholic District School Board, located in the North Bay Area with offices in North Bay, and; Nipissing University, also in North Bay. The premise behind the investigation was that there is a focus on input into schools in terms of curriculum and on output in terms of testing but there is also a real lack of attention to "the black box" (Black & Wiliam, 1998) of the classroom itself. In order to effect meaningful change and improvement in student achievement we need to focus on the teacher in the classroom.

The action research methodology based on the work of Jack Whitehead at the University of Bath (Whitehead, 1998, 1993, 1999) was selected because of its potential to affect teacher and student learning directly through practitioner research and teacher theorizing. The action research process starts with the formulation by the teacher of questions of the kind, "How can I improve my practice?" Through cycles of action, reflection and through sharing their findings, teachers theorize about their learning to contribute to the creation of the knowledge base of teaching and learning.

The research proposal was designed to make effective use of experience in action research and resources already available in the three organizations based on partnerships for previous projects by a number of the parties (Couture, Delong, Wideman, 1999; Delong &

Wideman, 1998). This is an innovative school board-university partnership in that the control of the research rests in the hands of the classroom teacher with the university and the school board providing a supportive role.

Purpose of the Study

This study investigated the use by teachers of action research to improve their teaching practice. Teachers analyzed their 1999 Education Quality and Accountability Office (EQAO) Grades 3 and 6 provincial test results, identified areas for improvement, and used the feedback/corrective action strategy (Sutton, 1995, 1997) to address the areas for improvement. They assessed the impact of the changes they had made on improving student learning.

Provincial testing provides a rich source of data that, if acted upon, can have a powerful impact on improving classroom practice. This study taught teachers how to analyze and interpret their provincial test data and then to make appropriate decisions based on the information.

Research questions for this study included the following:

- How can provincial testing be used to improve classroom practice?
- How can teachers use action research to improve their practice?
- What effect does the use of feedback/corrective action have on student learning?
- What helps and hinders the use of action research and feedback/corrective action?
- How can teachers contribute to the knowledge base of teaching and learning?
- How can school boards provide sustained support for teachers in the change process?
- Is action research a valid means to encourage career long professional growth?

Significance of the Study

If provincial testing by EQAO is to result in improvements in student learning, test results must be analyzed and acted upon. Top-down, provincial and school board initiatives

including training courses have been shown to have little impact on teachers' professional practices. (Fullan, 1982) The difficulty of transforming policy into practice in the workplace is recognized, not solely within the teaching profession, but also in other professions and occupations in the public and private sectors.(Brinkerhoff & Montesino, 1995; Belcourt & Saks, 1998)

It is important, therefore, to encourage alternatives to top down change initiatives and training-based professional development activities. One such alternative is for the individual teacher and school to take the lead by using inquiry-based learning methods to improve their own practice related to the provincial tests. There is a long-recognized tradition in the professions of inquiry based learning that results in substantial changes in practice (Houle, 1980). There is also a recognition in the literature on education of the importance of the individual teacher in the change process. (Fullan, 1993; Hargreaves, 1994; Wideman, 1992, 1995)

Action research is an inquiry-based approach to professional growth and school improvement in which teachers use research methods to identify questions about their practice, develop and implement appropriate changes, assess the impact of those changes, and share what they have learned with the profession as a whole.

While there has been considerable debate about the value of provincial testing, our point of entry is that since the data is available, how can the classroom teacher use it to improve student learning? This study provided the training and support that teachers require in order to analyze and apply the information gleaned from the provincial test results. The evidence of improvement in teacher practice and student learning exists primarily in the individuals, but there

are implications for overall school improvement if more teachers in a school were engaged in the process.

The perennial problem of effecting transfer of learning from workshops and conferences is addressed when teachers identify the area of need in their own classroom practice and take steps to address it. The change is inherent in the action research process. The teacher controls the question and his/her commitment to the learning. Action research appears to be a more effective strategy for professional development and improving student learning for all students. What really matters is what teachers do and think!

In the midst of the debate on practitioner research (Anderson & Herr, 1999; Anderson and Jones, 2000; Donmoyer, 2000), this study shows teachers studying their own practice and theorizing about their learning to become knowledge creators. When teachers become knowledge creators, they become more confident, competent, accountable. These teachers clearly express their renewed excitement and enhanced motivation for teaching and learning.

Within each report in Chapter 4, the teacher's voice is clearly evident. In writing this report, the authors have tried to let the participants' voices speak for themselves. The voices of teachers, individually and collectively, must be listened to and respected if school improvement is to become a reality. In doing so, the knowledge about education will be further developed. Teachers are central to school improvement.

Chapter 2 - Search of the Literature

The search of the literature was conducted using major educational databases, journal abstracts, web pages, and suggestions by educational authorities. The review is organized into the following four topics and their impact on school or student improvement:

- standardized testing;
- teacher voice;
- action research;
- feedback/corrective action.

The search revealed that there are as many different testing programs as there are countries, states and provinces that use them. While some of the comments and critiques apply to many of the testing programs, it would be unfair to apply them to all testing programs.

Standardized Testing

A survey of the literature pertaining to this topic revealed many contentious issues. Advocates claim that testing programs lead to stronger school and student achievement, result in better teaching practices, and often lead to school reform. Opponents, on the other hand, raise concerns about the validity, impact, and credibility of using tests as a measure of student and school achievement. Though there are many documents and articles written on the topic of testing, no clear evidence exists showing that the process of testing alone leads directly to improvements in school or student achievement.

In her workshops (Brantford, Feb. 17; North Bay, Feb. 28, 2000), Ruth Sutton points out that weighing the pig will not make it grow. This seems to be the case with testing programs. No matter how stringent the testing program, a positive impact only occurs when the data from the

tests are used as an impetus for improvement. Throughout the literature review this theme recurs time and again and merits serious consideration and further research.

The literature search on standardized testing is organized into two sub-categories. The first sub-category addresses the efficacy of testing programs, while the second sub-category focuses on how testing programs have been shown to result in improvements.

The Efficacy of Testing

The most prevalent criticisms in the literature about using tests to measure student and school achievement are "teaching to the test" and the narrowing of the curriculum (Cizek, 1998; Darling-Hammond, 1997; Herman and Golan, 1990; Koretz, 1991; Linn, 2000; Mehrens, 1998; and Wideen, O'Shea, Pye & Ivany, 1997). According to several studies in the United States and one in Canada, teachers who were polled or interviewed voiced their concerns about these topics more than any other. Teachers in British Columbia reported that testing had "narrowed the scope of what was taught, had created psychological pressures, had eroded their ability to teach creatively, and had directed them away from some fundamental aspect of education" (Wideen et al., 1997, p. 437).

As a result of pressure to improve test scores, greater emphasis is being placed on basic skill instruction and test preparation. In Herman and Golan's study (1990), it was reported that teachers were spending from one to four weeks preparing for the test by "having students complete worksheets that review expected test content, having students practice item formats expected on the test, and instructing students in test-taking strategies" (p. 30).

Many of the teachers say that time devoted to preparing for the test takes away valuable time needed to cover material that is not tested. This is what has been referred to by Popham (1999) as "measurement driven instruction" or by Madaus (as cited in Cizek, 1998) as

"psychometric imperialism" (Cizek, 1998, p. 28). While this practice may lead to improved test scores, some argue that this does not necessarily indicate improved learning. Linn (2000) states:

> the focusing of instruction on the general concepts and skills included in the test may be in keeping with the belief that the test corresponds to instructionally important objectives and may be considered acceptable, even desirable practice. On the other hand, the narrow teaching of the specific content sampled by the test, or coaching in specific responses to test items would be widely condemned as unacceptable practice (p. 7).

These comments demonstrate that different stakeholders may be at odds about what is important in education.

Other concerns that were raised in the documents reported that test results are often misinterpreted by the public (Hoffman, 1999; Linn, 2000). In effect, publishing test scores may be contributing to a false sense of security such as what has been coined "the Lake Wobegon effect". John Cannell found that most U.S. states and districts reported that their students were scoring above the national norm (Linn, 2000, p. 7). According to one critic "standardized, nationally normed achievement tests give children, parents, school systems, legislatures, and the press inflated and misleading reports on achievement levels" (Linn, 2000, p. 7). On the other hand, published data may lead some people to draw false conclusions about a school or school board. According to John Hoffman (1999), real estate agents who used test results to market certain neighbourhoods and schools were sued on the basis of low test scores by parents of children who had failed a grade. According to John Popham (1999), test scores are a poor indicator of educational quality.

> Employing standardized achievement tests to ascertain educational quality is like measuring temperature with a tablespoon. Tablespoons have a different

> measurement mission than indicating how hot or cold something is. Standardized achievement tests have a different measurement mission than indicating how good or bad a school is. Standardized achievement tests should be used to make the comparative interpretations that they were intended to provide (p. 3).

While these cases may represent the extremes on the spectrum, it is apparent that caution must be used when publishing ranked lists or test scores. We agree that "the unintended negative effects of high-stakes accountability often outweigh the intended positive effects" (Linn, 2000, p. 14).

If test scores cannot be used to measure school or student improvement accurately, how can they be used? If simply weighing the pig, or testing alone, will not lead to educational growth, how can test results be used to inform school and student improvement? This question leads to the remaining part of this literature review and will be the major focus of all subsequent sections.

Using the Test Results for Improvement

Documents showing a positive impact of using testing programs are far less abundant than documents describing the negative impacts. On the surface it would appear that there are many reasons not to use achievement tests but delving deeper it becomes apparent that testing programs can provide valuable information that can lead to school and student improvements. Helen Raham (1999) points out that:

> school assessment is as complex as learning itself, and only as valuable as the uses to which it is put. It should be carefully balanced between internal and external processes. The best assessment systems will change the internal dynamics of our schools to improve teaching and learning" (p. 43).

How can test results be used to inform strategies for school and student improvements?

According to many of the documents examined, one of the main benefits of using achievement tests is to provide information that can be used to improve and evaluate programs (Champagne, 1997; Dunning, 1999; Hoffman, 1999; Johnson, 1997; Popham, 1999; Raham, 1999). Once the information is gathered and examined it can be used to "illuminate a child's strengths and weaknesses" (Popham, 1999, p. 2). The challenge lies however, not in gathering the data but in analyzing it so that it can be put to use.

In Nichols and Singer's article *Developing Data Mentors* (2000), one innovative program is making use of the data that is collected. A small group of teachers and administrators are trained to become data mentors. Their job is to interpret the assessment results that have been recorded in a standardized data notebook and pass on information to the other faculty members. Similarly, a school in Toronto (Dunning, 1999) has organized staff into grade teams that work together to develop strategies that will lead to improvements. When EQAO test results revealed that the Grade 3 students had scored well below the average, the grade teams took action. They reviewed specific areas of weakness revealed from the results and developed a number of strategies to improve scores for the following year. By concentrating on reading comprehension skills, and including classroom routines "which encouraged students to develop independence and responsibility for listening carefully, explaining clearly, and completing tasks within a set period of time" (p. 19), the school was able to improve its scores considerably the following year.

In the Kawartha Pine Ridge District School Board, the EQAO tests are combined with the board's own testing to reveal areas of strength and weakness. Test information revealed some problems in geometry and spatial sense. The information was then used to increase training in this area and purchase new curriculum support material (Hoffman, 1999).

In the Grand Erie District School Board, Heather Knill-Griesser (2000), a Grade three teacher conducted an action research project on a number of strategies she developed after examining the test results of her class. Her question was, “How can I use quality math/literature materials to improve students’ attitudes towards math?"

The examples listed above show how test results can be used to lead to overall school improvements, but do little to provide the student with immediate feedback and help. Popham (1999) points out that "a second kind of useful inference that can be based on standardized achievement tests involves a student's growth over time in different subject areas" (p. 3). The test results of the individual child can be compared with previous test results to reveal strengths and weaknesses over time. In New Brunswick, tests are given in September so that the data can be used to develop a profile of student strengths and weaknesses (Hoffman, 1999).

Upon examining the literature on the benefits and drawbacks of using tests it becomes apparent that testing is only effective if it is used to drive school and student improvement. In order for this to happen a number of things must occur: first, the data must be collected and analyzed; second, the information that is revealed must be disseminated to the various stakeholders; third, the data analysis must inform a plan to improve programs; and finally, the public must be informed about both the benefits and the drawbacks of standardized tests and of the plan for improvement.

The challenge is to use this data to build success and increase the capacity of schools to respond to performance feedback by developing literacy to eliminate the fear of data, by helping the media and public understand the context of performance indicators, and by encouraging governments and school boards to provide expert assistance in interpreting results and setting and achieving reasonable targets. (Raham, 1999, p. 43)

Although achievement testing is by no means a new thing, it is apparent that the public perception is that it is a major indicator of school effectiveness and inevitably a means of teacher accountability. It is for this reason that the teacher's voice needs to be heard more than ever.

Teacher Voice

As accountability and school effectiveness has risen as a major concern in education, a fundamental shift has occurred. Although the greatest effect a teacher has is within the classroom, it is apparent from examining the literature that the teacher's role is expanding beyond the classroom. In addition to the daily work in the classroom, teachers are expected to, "keep abreast of new knowledge, individualize instruction for a diverse population of students, help all students achieve high standards, introduce new technologies into the classroom, become experts in student growth and development, help manage the school, and reach out to parents and the community" (Renyi, 1996, p. 1). Despite the high expectations of teachers, little attention has been dedicated to listening to the voice of the teacher. Action research, collaborative work groups, and professional development are some of the ways that teachers can study their teaching practices and find ways to improve student learning. (Anderson et al., 1999; Bodone & Addie, 1999; Dana, 1992, 1993; Delong & Wideman, 1996, 1998, 2000; Dunning, 1999; Johnson, 1997; Raham, 1999; Renyi, 1996; Roberts & Dungan, 1993).

According to research and teacher surveys, schools that are experiencing educational improvements report more instructional innovation, feel more involved in decision making and hold higher expectations (Herman and Golan, 1990; Newmann and Wehlage, 1995). The "grade teams" mentioned in the previous section are a prime example of this. Mac Hunter, principal of the Driftwood Public School in Toronto, describes the grade teams as the "key decision-making

units" whose role as professional educators working together is to "plan curriculum, establish performance expectations and set expectations for social behaviour" (Dunning, 1999, p. 18).

As the role of the teacher is expanding beyond the classroom, and more emphasis is being placed on accountability, many teachers are looking towards collaboration as a means to effect improvement. Studies have revealed that through collaborative groups, knowledge is broadened, new methods are learned, and communication is improved (Anderson et al., 1999; Bodone & Addie, 1999; Roberts & Dungan, 1993). By having the opportunity to collaborate with others, teachers are able to share their voices with other teachers, administrators, parents and others involved in the group.

It is not enough to give teachers a voice; they must be given a forum in which their voices are heard. Renyi (1999) states that:

> because helping students achieve requires the collaborative work of many adults in each school and community who share responsibility for educating students, teachers must participate in the collective growth and development of other teachers in the school. A fundamental part of that work is the continuous improvement and growth that changing times, changing students, and a changing society necessitate. Expanded roles for teachers must include opportunities to provide peer assistance and review. (p. 10)

Collaborative teams, action research and professional development opportunities are ways that will ensure teachers' voices are heard.

Action Research

Action research, reflective practice, and self-study are all part of the movement of practitioner researchers whose work is gaining credibility in the academic community.

Practitioner or insider research can provide the bridge between theory and practice. Teachers study themselves in their own classrooms and then integrate theory created at universities and elsewhere in order to create their own living educational theories. (Whitehead, 1989) Many academics recommend the building of the bridge (Murphy, 1999) but few are prepared to recognize practitioner research as a body of knowledge that can be that bridge. In addition to an inquiring mind, teachers need to learn and apply the skills of reflective practice and self study in order to study their practice and improve student learning. Donald Schon has extended his earlier work in the Reflective Practitioner (1983) to include a call for a new epistemology of practitioner scholarship (Schon, 1995). Journals dedicated to reflective practice and action research (Ghaye, 2000) and recent books on using reflective practice and action research for school improvement (Ghaye & Ghaye , 1999; McNiff, 2000; Sagor, 2000) demonstrate the growing recognition of reflection-on-action as a vehicle to examine practice. A new paradigm of research in which practitioners produce their own knowledge is described by Anderson and Herr (1999) in Educational Researcher as "research on the inside". As well, Connelly & Clandinin (1999) call for the narratives of teachers to shape a professional identity and describe and explain the "landscape" of teaching and learning. The work of the self-study movement (Hamilton, 1998; Mitchell & Weber, 1999; Russell & Korthagen, 1995) is gaining legitimacy as a self-reflexive process that enables teachers to make meaning of their lives and work.

Action research is one method that is frequently being employed in order to fulfil the teachers' expanding role. Many of the documents pertaining to the factors leading to educational improvement were the result of an action research project (Delong & Wideman, 1996, 1998; Ontario Action Researcher website www.unipissing.ca/oar; Secondary Teachers Action Research website www.action-research.org; Whitehead website www.actionresearch.net). It is

through action research that school improvement theories can be put into practice and tested by those who have the most experience in the classroom--teachers. "Action research is about seeking a voice with which to speak one's experience and one's ability to learn from that experience. It is also about helping others to find their own voices" (Winter, 1998, p. 53).

Through action research, teachers are focussed on answering questions about improving some aspect of their teaching or their students' learning. Jack Whitehead (1998), in a paper presented at the Annual Meeting of the American Educational Research Association, proposes that "educational researchers have a fundamental role to play in the development of a new paradigm of educational research. In this paradigm living educational theories are being created which can be related directly to the processes of improving students' learning." The theories are "living theories" because they are constantly evolving with the researcher as new information is gathered from the context of his/her own dynamic classroom.

Action research can also be a means by which teachers "derive meaning from current research within their own context, in a way which informs and explores their practice" (Carter, 1998, p. 275). Action research provides the teacher with a means of finding out what theories and practices work. For example, a number of action research projects were undertaken to examine whether or not cooperative learning strategies would lead to school improvement (Burhorn, Harlow, Van-Norman, 1999; Catlin, Lewan, Perignon, 1999; Foster, Gaa, Nowicki, Ross, 1997).

The literature on this topic reveals that valuable gains are made in educational improvement through the use of action research (Anliker, Aydt, Kellams, Rothlisberger, 1997; Brookbank, Grover, Kullberg, Strawser 1999; Catlin, et al., 1999; Charbonneau & Ribar, 1999; Delong & Wideman, 1996, 1998, 2000; Householtzer & Schrock 1997; McNiff, 1988, 2000;

McNiff, Lomax & Whitehead, 1996; Naffziger, Steele, Varner, 1998; Thurman & Wolfe, 1999; Whitehead, 1989, 1998, 2000). The findings of the action research projects are immediately applicable as the practitioner is the researcher. As action research is obviously an effective means of school and student improvement, teachers and administrators need more vehicles like The Ontario Action Researcher (www.unipissing.ca/oar) and conferences like Act-Reflect-Revise and the Ontario Educational Research Council to validate and share their findings. It would be beneficial to all if the information derived from the action research projects were to be disseminated to as many educators and researchers as possible. Recent print publications (Halsall & Hossack, 1996; Delong & Wideman, 1998; McNiff, 2000) contain stories of teachers and administrators who are "creating a professional identity" (Connelly & Clandinin, 1999) through action research projects. By establishing collaborative support groups, encouraging action research, and offering professional development, teachers' voices will be more likely to be heard.

Feedback/Corrective Action

Feedback and corrective action are described as an integral part of effective teaching in many of the texts and articles that have been reviewed. Although there is a wealth of information on this topic, with the exception of Ruth Sutton (1995, 1997), the documents tend to predate the 1990's. This does not indicate that feedback and corrective action is no longer an important factor in educational improvements but more likely indicates that the evidence has been accepted and incorporated as fact. This, however, does not necessarily imply that this information is being put to use.

One important document must be mentioned in detail when discussing the importance of feedback because of the wealth of information it contains. Inside the Black Box, written by Black and Wiliam (1998), undeniably contains the most complete information on feedback that

has been published to date. Black and Wiliam, surveyed 580 documents which led them to the conclusion that formative assessment is at the heart of effective teaching. Black and Wiliam (1998) also propose a way that feedback can lead to educational improvement. They describe a four-step process in which formative assessment can be implemented in the classroom. This proposal includes forming a collaborative work group to develop methods of assessment, dissemination of knowledge and good practice, a reduction of obstacles by making testing interactive with formative assessment practices, and continuing research. They assert, "There is a body of firm evidence that formative assessment is an essential feature of classroom work and that development of it can raise standards" (Black and Wiliam, 1998, p. 19).

According to Grant Wiggins (1998), effective feedback is "highly specific, directly revealing, or highly descriptive of what actually resulted, clear to the performer, and available or offered in terms of specific targets and standards" (p. 46). Clearly, the more specific and constructive the feedback, the more it will affect school or student improvement. Ruth Sutton (1997) takes the concept of feedback one step further describing what she calls "feedforward". Feedforward takes the initial feedback results and uses them to set goals or targets. It is through goal setting that feedback can be used to make improvements. By offering continuous feedback to the learner, the learners are empowered to effect their own improvement. Feedback should be ongoing and reciprocal. That is, feedback should be given to the learner, the teacher, the policy maker, the administrator, the parents, and the larger community in order to be most effective. It is through feedback that change is effected. Through feedback change may be effected.

Conclusion

This literature survey reviewed a number of topics and their impact on school or student improvement. It is apparent that educational improvement is multi-dimensional and cannot be

changed by a "magic bullet" leading directly to educational improvement. (Fullan, 1993) It is an ongoing process that must incorporate a number of strategies to be effective. Testing programs can be used to inform educational improvements when teachers have the knowledge and skills to analyze the results and use that data in investigating their practice. Real change in teaching and learning practices can be effected through teachers conducting research within their own classrooms using action research and sharing their "living theories" (Whitehead, 1989, 2000) in order to build a knowledge base for the professional educator.

Chapter 3 - Methodology

This phenomenological study used qualitative research methods to investigate the experience of the participants as they used action research and feedback/corrective action to improve student learning in relation to the results of the 1999 Grades 3 and 6 EQAO provincial testing. The study sought to enable teachers to tell their own stories because the voice and values of the teacher are considered to be essential in the development of educational knowledge. This chapter describes the methodology used in the study including participation, procedures, data collection, data analysis, and validation of the findings.

Two Ontario school boards were involved in the study, one public school board in the southern part of the province and one Catholic school board in the near north. The Grand Erie District School Board is located in southwestern Ontario in the counties of Haldimand, Norfolk, and Brant. The board includes 60 elementary and 17 secondary schools and serves a student population of approximately 32,000. The Nipissing/Parry Sound Catholic District School Board is located in the Districts of Nipissing and East Parry Sound, includes 13 elementary and 1 secondary school, and serves a student population of approximately 4,000. By car the distance between the two school boards is about 450 kilometers or five hours driving time.

The Grand Erie DSB has been working with its staff on action research for six years. The board has sponsored three provincial conferences and has participated in a number of partnership projects including publication of the Ontario Action Researcher (www.unipissing.ca/oar/). The current research project is the most intensive. The Nipissing-Parry Sound CDSB began its action research initiative more recently. It has provided one intensive action research project for leadership candidates. The current project is its first for classroom teachers.

The approach to action research in this study is consistent with the work of Jack Whitehead (1993) and his colleagues (McNiff, Lomax, and Whitehead, 1996). Dr. Whitehead (www.actionresearch.net) is a lecturer at the University of Bath and world-wide authority on action research and, since 1995, has devoted substantial time, leadership, and encouragement within the Ontario context.

Consistent with a belief in the value of organizational and individual partnerships, the principal researchers and participants in this study operated as co-learners. Participants helped shape the methodology during the data collection phase and influenced the conclusions. In the latter stages of the project, they reviewed and discussed the draft report and their comments resulted in revisions to produce the final report.

Participation

In the autumn of 1999, principals and support staff in each school board were asked by their respective superintendents to invite pairs of interested elementary teachers to attend an information meeting about the study. Teachers who attended the meeting in each school board received an information letter about the project (Appendix A). They were assured that participation was voluntary and that they might withdraw at any time during the project without prejudice or penalty. Each teacher who agreed to participate signed a Commitment to the Project and Release of Information Form (Appendix B) and later agreed to have their names included in the final report (Appendix C).

Twenty-five teachers began the project in the autumn of 1999. Thirteen were from the Grand Erie DSB and twelve were from the Nipissing-Parry Sound CDSB. Twenty-one were classroom teachers from ten different schools. Four of the teachers were consultants who

conducted their action research on how to improve their own abilities to assist teachers to conduct action research.

As far as possible, teachers worked in teams of two per school acting as each other's critical friends (Whitehead, 1993). One school had four teachers participating. Another school had a single teacher. In that school, the vice-principal, who was not a participant in the project, acted as a critical friend for the participant.

During the autumn, the two-teacher team from one of the schools left the project due to other priorities and time pressures. Another teacher left the project to begin a leave of absence. The other member of that school team continued in the project working by e-mail with a critical friend from another school. One other teacher accepted a consultant position and continued to participate in the study in that capacity.

Consequently, seventeen teachers from nine schools and five teacher consultants completed the project and submitted action research reports. One pair of teachers had conducted a joint study and submitted a joint report. All other teachers conducted individual studies and submitted individual reports. The teachers who completed the study are listed along with their schools in Table 3.1.

Table 3.1

Research Participants

School	Teacher	Grade(s)
Bloomsburg	Anda Kett	4
	Margaret Juneja	3
North Ward	Sharon Harrison	3/4
	Nancy Davis	4

	Frances Lainson	7
	George Neeb	6
J.L. Mitchener	Julie White	4
Lynndale Heights	Diane Clark	6
	Liana Thompson	7
Corpus Christi	Karen Dunn	5/6
Our Lady of Sorrows	Maggie Sullivan	4
St. Gregory	Linda Gordon	2/3
	Marg Kelly	5/6
St. Joseph	Joyce Johnson	5/6
	Elizabeth MacLeod	4/5
St. Alexander	Bev White	4
	Anna-Marie Aquino	3/4
Centrally Assigned	Karen Fabbro Cobb	Consultant
	Cilla Dale	Consultant
	Rosemary Conlon	Consultant
	Elaine Thomas	Consultant
	Janet Rubas	Consultant

The participants taught grades from 2/3 to 6/7. They included teachers of students in Grades 4 and 7 who had participated in the EQAO testing in 1999 and teachers of students in Grades 3 and 6 who would be tested in the spring 2000. In addition, the study included teachers of students in grades 2 and 5 who would be tested in 2001.

All but one participant were female. This gender balance is largely explained by the predominance of females teaching in the elementary grades.

Procedures

During the autumn, winter, and spring of 1999/2000, monthly meetings of participants were held in each school board. Five and one-half days of meetings were held in the Grand Erie DSB and five days were held in the Nipissing-Parry Sound CDSB. Due to local circumstances, time, dates, and lengths of individual meetings in each school board varied to some degree. For example, the meetings in the Grand Erie DSB began earlier in the school year than the meetings in the Nipissing-Parry Sound CDSB. However, meetings in the Nipissing Parry Sound CDSB continued later in the school year. Table 3.2 chronicles the procedures in each school board.

Table 3.2

Research Meetings and Topics

Month	Grand Erie	Nipissing-Parry Sound
October 1999	Meeting 1 (full day) – Information about the project. Introduction to action research and feedback/corrective action. Participants begin analysis of EQAO data. Meeting 2 (half day) – Information about the action research process including question formation and data collection. Participants	

	continue analysis of EQAO data, identify areas of concern, and begin to draft research questions.	
November	Meeting 3 (half day) – Participants present their research questions and clarify them through discussion. Participants discuss their studies and data collection. What evidence do we have? What evidence will we collect?	
December	Meeting 4 (half day) – Participants present data they have collected. Data is analyzed through discussion. Participants identify next steps in their projects.	Meeting 1 (full day) - Information about the project. Introduction to action research. Participants analyze EQAO data and identify areas of concern.
January 2000	Meeting 5 (half day) – Further discussion of participants' action research projects and specific events to date.	Meeting 2 (full day) – Introduction to Feedback/corrective action. Participants identify, discuss and refine action research questions. Participants discuss their studies and what kinds of data might be collected in regard to particular research questions.
February	Meeting 6 (full day) - led by Ruth	Meeting 3 (full day) – led by Ruth

	Sutton. Information on feedback/ corrective action. Participants share their research and solve problems through discussion.	Sutton. Information on feedback/corrective action. Participants share their research and solve problems through discussion.
March		
April	Meeting 7 (half day) - Information on format and content of participants' research reports. Further discussion of participants' action research projects and specific events to date. Participants begin to write.	Meeting 4 (half day) – Further discussion of participants' action research projects and specific events to date. Participants present data they have collected. Data is analyzed through discussion.
May	Meeting 8 (full day) - Participants write and co-edit their research reports.	Meeting 5 (half day) – Information on format and content of participants' research reports. Participants discuss data collection and analysis and preparation of reports. Participants begin to write.
June		Meeting 6 (full day) – Participants write and co-edit their research reports.

The meeting agendas were shaped in discussion with the participants. Substantial amounts of time were provided during the meetings for participants to work individually, with

their critical friends, and with participants from other schools. They analyzed their EQAO test results, identified areas of concern, developed action research questions based on their concerns, designed their action research studies, discussed their data, findings and conclusions, and wrote their research reports.

Time in meetings was also devoted to presentations, workshops and discussion about action research and feedback/corrective action. Diane Morgan provided expertise in action research and feedback/corrective action in both school boards. In addition, Ruth Sutton, an internationally-recognized consultant from the United Kingdom, led one full-day meeting with participants in each school board on feedback/corrective action.

The format of the meetings was based on an experiential learning model (Kolb, 1984). Participants began by reflecting on their own experience with their students. They built understanding by analyzing the test results and hearing from guest speakers. Then, they applied their understanding to their own action research. As the project progressed, all aspects of the meetings became grounded in the participants' own experience with their action research. Participants' wishes increasingly informed the meeting agendas.

Data Collection

A wide variety of data was collected during the project to maximize the teachers' voices and the validity of the findings. The following data was collected.

1. The monthly project meetings were either tape recorded and transcribed, or informal notes were kept of the proceedings of the meetings. The researchers also kept informal notes of their own observations and thoughts throughout the data collection stage.

2. Each teacher kept a written journal from the beginning to the end of the project. At the conclusion of the project they submitted their journals or, at their discretion, excerpts from their journals.
3. At the conclusion of the study, each teacher completed a questionnaire (Appendix D) about their reactions to the project. Three randomly-chosen participants from each school board were also interviewed to obtain more in-depth information than could be obtained using a questionnaire alone. These interviews were either tape recorded and transcribed or summarized.
4. At the end of the project, each teacher produced and submitted a written report on his/her action research. Teachers were encouraged to write their reports in the first person singular and to include examples of data in appendices. Teachers were asked to include the following information in their reports (McNiff, Lomax, and Whitehead, 1996; Delong and Wideman, 1996):
    - What was your action research question? Why was it important to you?
    - What did you do to investigate your question? How did you modify your practice?
    - What data did you collect to show the impact of what you did?
    - What did you find out? How could you show that you took care that your judgements were reasonably fair and accurate?
    - What conclusions did you draw? What are your next steps?

Data Analysis for Full Study

Informal data analysis occurred during the data collection stage as the principle investigators met, by teleconference and occasionally face-to-face, to plan and discuss the

monthly meetings of participants. The principle investigators in each school board kept their own notes of these discussions during the course of the data collection.

In May, principle investigators from both sites met face-to-face for two days to compare their notes and make a list of tentative findings. Tentative findings from each site were compared and amalgamated. The draft findings informed the formal data analysis stage that followed and were modified and enlarged by the formal analysis.

Formal data analysis began in June 2000 after the bulk of the data collection was completed. The analysis focused initially on the participants' research reports and questionnaires. Meeting transcripts and notes and participants' journal entries were then reviewed to validate the findings and to provide additional anecdotal examples.

Each participant's action research report was read and summarized under the following common headings: research question and significance; methodology; findings and conclusions. Each participant checked his/her summary for accuracy and the summaries were revised based on the comments received. Data from the original reports and the summaries were organized in chart form. Themes were identified from the data and described. The reports of classroom teachers and consultants were compared.

Questionnaires were compiled and summarized by question. The questionnaire data were compared by school board. Responses by classroom teachers and consultants were also compared. A first draft of the research report was completed in August, 2000.

Validation of the Findings

The findings were validated in a number of ways. Firstly, the experiences of the participants in the two school boards were compared for similarities and differences. Secondly, throughout the analysis, the principal researchers worked individually, in pairs, and as a group.

Analysis conducted individually or in pairs was reviewed and revised again by the larger group of researchers.

Thirdly, all the participants reviewed the draft research report for accuracy of perception and recall. Revisions were made based on their comments. Finally, in November, the 2000 EQAO school test results were analyzed by the principal researchers and the participants who taught Grades 3 and 6, to see whether improvements in student performance identified by those participants during the study were reflected in the test results.

Chapter 4 - Action Research Reports of Participants

This chapter includes summaries of participants' action research projects. The summaries are organized in two sections, Action Research Reports of Classroom Teachers, and Action Research Reports of Centrally Assigned Teachers.

To ease understanding, all reports are written in a common format. The account begins with the question the participant investigated and why it was significant, particularly in terms of the EQAO test results. Then each participant describes the methodology- what they did to study the question, and the kinds of data they collected. Finally, each account includes the findings and conclusions of the participant's study including, where applicable, their next steps. Reference to Levels 1, 2, 3, and 4 in the accounts refers to the Levels of Achievement in the Ontario Curriculum

Action Research Reports Of Classroom Teachers

Improving Language Skills to Meet Grade Level Standards

Anda Kett
Grand Erie District School Board
Bloomsburg Public School
Grade 4

Research Question and Significance

My action research question was, **"How can I effectively improve the language skills of my weakest grade 4 students to meet grade level standards?"**

The five students in question are currently working at level 1 and 2 on the provincial testing, and three of them are identified special needs students. I would like to bring them up to a more consistent level 2, perhaps an occasional level 3. Because of their language skills they are having difficulty and are in dire need of some confidence enhancement. I feel that focusing on the oral habits and patterns will improve the language awareness and then hopefully the student's ability to communicate ideas more effectively. Throughout the year, I've noted that flaws in written work are also reflected in the way children speak. No hearing problems have been confirmed.

When we are unable to communicate a thought clearly, we are at a serious disadvantage. This applies to all aspects of life. Speech problems in the primary years are addressed with enthusiasm, but once a child hits the junior years the errors are more subtle and often overlooked

as something "he'll grow out of as he gets more exposure to proper language." However, our students are not always exposed to proper language use throughout their daily life and consequently they develop sloppy habits that reflect negatively on them. In making the connection between oral and written language for the students, I hope to bring them to a higher level of functioning where they will be more comfortable with language and will be able to function at a more independent level when they are promoted to the next grade. Without significant improvement in their language skills, their future will include many struggles, one of them being the Grade 10 literacy test.

Methodology

The Grade 3 EQAO Language test results for the 5 students were analyzed and then compared with the level they were demonstrating this year. The same test was then given in the second term of Grade 4, and those results were compared with last year's test results. In addition to anecdotal observation, emphasis has been put on oral communication as much as written skills. Language has been practiced through various methods such as discussions, book talks, informal oral reports, formal speeches, listening to stories, rehearsing stories before writing, and daily log book writing. Focus in written work was on sentence structure, grammar, vocabulary/wording, and spelling. Then as ideas began to develop and become more complex, the focus was extended to idea development, sequencing of ideas and paragraph structure.

As time went on, it became clear that my expectations were progressing faster than the students' skills and levels of achievement were beginning to decline. They were unable to develop a complete paragraph so we went back to the concept that thoughts can be extended and developed to reveal more detail and answer more questions. Relationships between ideas were explored. As their awareness of this improved slightly, they were occasionally able to explain

more orally; however, getting it down on paper was too challenging for them. The data that were gathered to reveal this were taken from formative evaluation on various activities stemming from a novel that was read to the class. This ensured that the results were reflecting the students' ability to think and communicate their thoughts, not solely on their ability to read or write. Transcripts of oral one-on-one questioning revealed that some of them were able to answer some questions after all! However, their responses were still quite brief and simple and would be assessed at Level 1 or 2. This was, however, definitely an improvement over a blank piece of paper, which is what some of them handed in at first.

We used a story about a boy's survival in the wilderness of northern Canada. It fit in well with the habitat component of the curriculum and is an inspiring novel that got many of the more advanced students hooked on the author. Many aspects were discussed in class and reinforced during the reading of the novel by me to ensure the continuous understanding of the many inter-related themes.

Class discussions did not help in the formative assessment of the students in question because they were reluctant to participate and the more vocal students dominated the entire experience. After hearing some of the others' ideas however, one wonders how their ideas might have affected the responses of those students involved in the study. As it turned out, there was no sign of any long term carry over of ideas. Is this due to lack of listening or understanding?

In order to build on the responses from the students, I made an effort to make sure the questions and expectations were clear and would often rephrase and repeat. Corrective feedback was given to any response and further thinking was encouraged. Ideas were classified according to levels of evaluation and improvements were added to demonstrate higher level thinking. This

corrective action and formative assessment was continually used in classroom modeling and in personal evaluation.

Findings and Conclusions

The level of responses in the Grade 4 class is fairly consistent with their performance on the EQAO tests. Under conditions of the test, 4 of 5 students were not accommodated at all and thus scored pretty consistently at Level 1 and 2, which is comparable to independent work produced in class. Even with oral prompting from the teacher, responses continue to be brief and simplistic. Thinking skills are quite basic and students have trouble retelling parts of the story. Relating and reflecting skills need significant assistance and prompting. The summative evaluation is based on an average of the skills of reflecting reasoning, communication, organization and use of language conventions.

All of the students studied in the research are hesitant to participate orally in class, and need encouragement and prompting to do so. Even personal discussions with them are very one sided, with the teacher/adult always leading the train of thought. It seems these children have had little practice expressing their ideas up to this point in their lives and that little encouragement has been provided in the area of relating ideas to each other. Things are accepted at face value. For them, asking questions (who, what, when, why, where, how) will need a great deal of modeling, encouragement and practice. Unfortunately these skills are needed in the junior years and these students are just beginning to be aware of them. Questioning and thinking skills need to be started, by parents and teachers, earlier in order to prepare the child for the increased demands of the curriculum.

Once students' thinking skills start producing more detailed ideas, the reasoning, organization skills, and language conventions will have more meaning to them and they will then

have something more concrete to work with. So far, their communication skills appear to be weak because they have so little to share and therefore, have not had enough experience practising these skills.

Changes in evaluation practices need to be made to accommodate those students whose thinking cannot be clearly communicated. A summative evaluation needs to be supported with numerous and various formative assessments. Anecdotal records are a valuable tool in identifying the progress of the student. Modeling of the process and expectations needs to be consistently practiced by the teacher to establish better understanding of the concepts. This gives the student a more concrete view of where they fit in and what they need to do to improve.

Different communication techniques were attempted throughout the research, some more successfully than others. It is important to continue to work with those that were successful and to improve those that weren't. Students need to have a variety of purposes, goals and audiences to give their words meaning. Whole class discussions should be combined with small group and one-on-one conversations. The sharing and recording of ideas can be accomplished in many ways, by the students or the teacher, and through these experiences, the weaker students will hopefully build awareness and start to improve their own communication skills.

Increasing Knowledge and Problem Solving Skills in Math

Margaret Juneja,
Grand Erie District School Board
Bloomsburg Public School
Grade 3

Research Question and Significance

My research question was, **"How can I help to make my class efficient problem solvers while increasing their knowledge of the basic math facts?"**

My concern arose because my class entered Grade 3 with little knowledge of even the addition and subtraction facts. In other years, I felt I had given the children lots of practice in solving word problems. I had given them daily problems to solve but was not as methodical as I should have been in my approach to helping the children improve. The results on last year's EQAO testing showed that many in my class were not proficient in this regard.

Methodology

I decided to try a two-fold approach to help change the way I taught Math. I started by making up sets of flash cards in the four fact areas and sent them away to be reproduced on card stock. I made enough so that my children could work in pairs. Every day they would drill each other on the stack of cards and then have a three minute 50 question quiz. The quizzes became harder as time went on. The marks were recorded every day so that improvements could be charted.

My other strategy was to teach directly all of the 12 problem solving strategies--one

a week. First, I modeled the method. I went over how it was done and asked questions as I went along. The class copied this first example into a separate problem-solving notebook. The second time the children worked on the problem in pairs. All of their work went into the problem-solving notebook. The children were told whether their answer could be considered Level 3, 2, or 1. At first, the children wrote simple incomplete solutions, but gradually many of them were able to write quite complex answers. I continually reinforced the ideas of using pictures, numbers, and words to show solutions. I also encouraged the use of precise math language to communicate their ideas. Exceptionally good solutions were praised in class. The third time the children worked on the problem individually. All solutions were graded. Verbal corrective feedback was given in order to help the children improve their answers. I always tried to point out what the child was doing that was correct, as well as areas in which he or she needed to improve in order to give a better response. On several occasions, problems were sent home so that families could work on them. Even parents had difficulty with some of them! I made sure to point out to the class that there were many different ways to solve problems. As long as the solution was correct, the method may differ and still be acceptable.

I made a point of telling parents on the interview day in December that I had undertaken this project in an effort to improve the children's performance in Math. Most parents were very encouraging and were willing to help their children learn the math facts at home in order to increase their competency**.** However I did receive some negative comments.

By the end of December, I had taught 6 of the 12 problem solving strategies and had drilled the addition facts to eighteen and almost finished with the subtraction facts. I had kept track of the results of the daily quizzes and most of the children were significantly improved in their recall of the facts taught so far. I had also tried using corrective feedback with my class in

other ways. I gave them a math test on subtraction and then went over the questions one by one. I asked individually if they needed more clarification, and then gave them another test a few days later. Most of the children did significantly better the second time around. I had told them I would keep the higher mark.

By the end of January I was starting multiplication, which was new for most children. I employed the same pattern of daily flash card drill with a partner, followed by a three minute 50 question quiz. By examining my formative results to the daily quizzes, I could see many children were improving in their recall of facts.

By the end of March I had finished multiplication and was starting division. In other years, I have found the children have trouble with division. But this year I was pleasantly surprised! This class quickly understood the concept and realized that division is the opposite of multiplication. They were doing very well on the daily quizzes. I can only believe it is because they are so competent in their knowledge of the multiplication facts that once they understand the relationship between division and multiplication, they are able to find the answers. I taught all 12 problem solving strategies as well.

Findings and Conclusions

Until Fall, I will not have the concrete results as to whether my method of teaching math this year has been effective in increasing the scores. However, as I observed the children working at their problems, I was amazed at the math language that I heard and that they were usually on task. They took great pride in being able to come up with the answer and were eager to show me their written work. I am certain that my class's attitude to math has certainly improved. On the whole, they are eager learners, always willing to try, and they display both confidence and competence in their approach to math.

I would ask children how long they took to work out problems they had taken home. Often, an evening would be spent working on them. One parent commented that they had great difficulty with the problem but that they had persisted until the child was able to understand. Another mother, who happened to be in the school volunteering, popped her head in to ask if the solution the family had worked out was correct. I even heard comments from other teachers who had siblings of my students in their classes as to how families had worked on the problems together. One child, in a spontaneous comment, told me that he felt more confidence in his ability to solve problems and that it was getting easier. Another child, after learning a few of the strategies, actually used an earlier strategy to solve that day's problem.

For myself I am excited about this way of teaching math problem solving skills. I can see the results clearly in the written responses the children give. I focus more on the process that the children use, rather than the product. I give much more corrective feedback, both oral and written. Seeing children smile when you tell them what great answers they have given is certainly a wonderful reward. My assessment methods have changed in that I make sure that I build in time for the children to have another chance to try an assignment, after corrective feedback has been given.

Improving Written Communication in Mathematics, Grades 3 & 4

Sharon Harrison and Nancy Davis
Grand Erie District School Board
North Ward Public School
Grades 4 and 3/4

Four teachers, Sharon Harrison, Nancy Davis, Frances Lainson, and George Neeb, worked together in the same school. There was a great deal of collaboration between them as their area of research was also a school focus. Sharon and Nancy submitted a joint report on their research. Frances and George submitted individual reports. There was overlap among the reports and, therefore not all of the findings are included in each summary.

Research Question and Significance- Sharon and Nancy

Our action research question was**, "How can we improve written communication in Mathematics?"**

We decided to pursue students' written communication in math, as the results on last year's Grade 3 test were weak in this area. We found it interesting that the overall achievement in Mathematics was 50% at Level 3 and 4 and the breakdown in the knowledge categories indicates that the majority of the students were at Levels 1 and 2. This would indicate to us that the weaknesses lie in written responses. Students are expected to solve math problems and clearly describe their thinking and understanding of concepts using appropriate math terminology and symbols. All or some of these expectations may be the cause of poor communication scores on the provincial results. Thus, math results will be negatively influenced

by poor written communication. In fact, there was an overall weakness in student's ability to communicate understanding in Mathematics.

Methodology

Our goal was to provide students with the skills to explain their answers to problems in written form. We believed that modeling was important to student success. Previous test problems were given and feedback was shared using anchor booklets. The students were exposed to Levels 3 and 4 from anchor papers. They were encouraged to draw pictures and use numbers and words to solve mathematical problems. A problem-solving model was shared. Group math journals were used to promote oral discussions and allowed students to see a variety of answers to given problems. The "problem of the week" allowed parents to become involved in the project and made them aware of the types of questions being asked and how they could help their child with math concepts.

Each week students were given the "problem of the week" to work on over the weekend.

Parents were encouraged to discuss the problem with their children and suggest possible strategies. Response from the parents indicated they had difficulty suggesting strategies. Mid-week we discussed the problem as a class and developed possible strategies. Through modeling the students were taught the skills of communicating their answers through pictures, numbers, and words. The strategies for solving problems such as "guess and check", "drawing a picture", and "using tables/charts" were introduced with appropriate problems.

In order for students to communicate in math we developed a math vocabulary dictionary. In groups, students brainstormed lists of words beginning with letters of the alphabet. The charts were posted for several weeks and students developed their own dictionaries. They were continually encouraged to use the terminology when explaining solutions to the problems.

Students were given the opportunity to explain math concepts orally and were much more successful with this form of communication. Problems seemed to occur when students had to explain their solutions in written form. With our consultant's help, students were presented with the concept of group journaling. The whole class was presented with a simple problem and solutions were discussed and recorded on the blackboard. The class then came to a consensus on the right answer. Students were divided into groups of 5, with names such as The Problem Solvers and the Marvelous Math Monkeys. They began by solving a similar problem individually. When they felt they had a correct solution, they shared it with their group. If the group agreed that it was correct, they put it on chart paper and shared it with the whole class. Each group shared their solutions with the class. Problems presented could be solved in more than one way. Later, they were given the same question and were asked to explain their solutions in their math journals.

We wanted to alleviate the stress of the unknown and give the students the opportunity to experience the Grade 3 test situation. Starting in January, we used test samples from previous years and administered the test as it would be done in May. Using overheads, we demonstrated Level 3 and 4 answers from the anchor papers and exemplars. We focussed on the use of pictures, numbers, and words to find solutions. The students were able to ask questions about Level 3 and 4 answers and were given the opportunity to redo the questions and be reevaluated. Practice tests were sent home to parents so they could get a better understanding of the types of questions asked. A meeting was held on April 18th to discuss the test and the ways parents could help their children through it.

In late April we administered last year's test exactly as it was given (except for the computer booklet component) over a 5-day period.

Findings and Conclusions

We found that when we first began the "problem of the week" students had difficulty showing and explaining their work. Many sheets had just the answer. For example, only 7 of 27 students completed their problems with pictures. However after 4 weeks of modeling, 21 of 27 completed the answers using pictures, numbers, or words. Now the class consistently solves problems using all three techniques. In the beginning parents sent notes saying they had difficulty helping their children. Now they say "Keep sending the "problem of the week" My child is getting better at thinking them through," and, "I am learning to rephrase questions such as describe and explain." We found students carrying math vocabulary over into other subject areas.

Most groups worked successfully to solve problems but there was some difficulty with "free riders." It is important to have a good mix within the groups and we decided that working in pairs rather than groups of 5 might be better. We had to stress the importance of accepting all ideas. Putting down a wrong answer and stating it was wrong was acceptable because it showed the child's thinking. We got comments from the students such as, "Now I get it. When Alan said, 'Let's do a table,' I could see the answer."

The January results of the sample tests were very disappointing. The students did not apply the strategies taught. Using corrective feedback on the test questions, allowing them to rewrite, and showing them Levels 3 and 4 brought significantly better results in April. Most students used pictures, numbers, and words and demonstrated a greater understanding of what was required to reach a Level 3 or 4. They were also interested in achieving a higher level. When we would tell a student their answer was a Level 3, they wanted to know how they could achieve Level 4 and other students in the class were able to tell them how to do it.

We plan to continue conferencing with students, rather than basing assessment on quizzes, test, drills, and daily work. It gives us a clearer picture of where the child is and what needs to be done to help him/her further. Listening to students as they work with manipulatives helps us to understand their thought processes. Our records will show a more anecdotal approach to marks than grade marks. We also plan to continue modeling with students. We have modified our program to meet the needs of students by giving them a variety of methods to solve relevant and meaningful Grade 3 problems.

The results from last year's test, administered in April, indicated the students were developing a clearer understanding of how to approach a problem and solve it. We noted that their answers clearly indicated improvements in their thinking. We feel we have prepared them to achieve to the best of their ability on the upcoming tests.

Communicating Understanding of Mathematics

Frances Lainson
Grand Erie District School Board
North Ward Public School
Grade 7

Research Question and Significance

My research question was, **"What can I do to improve the students' ability to communicate their understanding and thought processes related to mathematics?"**

From looking at the school results from last year's Grade 6 testing, there was an overall weakness in the students' ability to communicate understanding in mathematics. Students are expected to solve math problems and describe clearly in writing their thinking and understanding of concepts using appropriate mathematical terminology and symbols. This was the first year for the Grade 6 test. I also had the following concerns about the EQAO standardized testing. The test is based entirely on written responses. Some students have a lack of interest in performing well on the test and it is a high stress, artificial testing situation, in that students are not allowed to receive any assistance from the teacher or others as they are normally accustomed to receiving. The marking assessment is not clearly specified making students unsure of which sections of the test are more important than others. (Three other teachers expressed these concerns as well)

Methodology

In order to increase students' performance in communicating understanding, I planned to:

- explicitly teach problem solving steps and strategies

- outline evaluation expectations
- teach required math terminology regularly
- allow students a chance to orally communicate and conference
- encourage parental involvement
- offer immediate corrective feedback
- replicate testing circumstances in the classroom.

Students need to expand their approaches to problem solving. I spent two weeks in September explicitly teaching these strategies. Each day I gave students a problem and asked them to attempt to solve it using a specific strategy. With direct guidance, they achieved various levels of success. For the remainder of the year, I made reference daily to this list of strategies, pasted in the front of their notebooks, whenever they had to solve a problem in mathematics and other areas of the curriculum. Many students would still not refer to the list, or if they did they claimed that they still "don't understand how to do this". I asked them to select and try a strategy and if it didn't work to move on to another one. I remember writing in my journal, "that they have limited deductive reasoning skills and are not risk-takers." They did demonstrate an ambition to try to improve. Students not only need to know how to solve a problem but they need to know the importance of explaining an answer. I have explained to the students that just getting the right answer is Level 2. Only by explaining how the problem was solved will it be a Level 3. EQAO testing uses the terms "pictures, numbers, and words." I have asked students to do this repeatedly. I also gave students a sheet, "Steps for Math Problem Solving- 6 Steps for an Awesome Answer", that was given to me during the action research project. These steps have been reviewed continually. Students have the sheets in their journals for handy use and I remind them to take the sheets out and review them each time we use a problem solving strategy.

In order for students to effectively communicate their understanding in math, they need to use proper terminology. Students record all math definitions that we come across in their math books for easy reference. It is important to review these terms and formulas regularly in meaningful activities. Finding similarities and differences in math concepts helps to solidify their understanding. For example, when discussing volume I asked students what other math concept was similar to volume in meaning the space inside. We concluded that area was similar. We discussed how the two terms were different. I used base ten cubes to illustrate and emphasized the units and how they relate to the model and dimension. Terminology was also posted on examples around the room for reference.

I gave students a chance to communicate orally, follow the steps of the writing process, peer conference, and gradually remove the dependence on the peers. I began by having students use the entire writing process to write a "how to" paragraph explaining how to make a peanut butter sandwich, ride a bicycle, or tie a shoelace. I emphasized the need to use proper terminology, and to explain in detail, assuming the reader knows absolutely nothing about the topic. They did well with the peer conferencing and editing. We related the writing to mathematical explanations. I allowed the students the opportunity to work in groups, sharing their strategies to solve math problems. When they had written their responses individually, I asked them to switch journals with a partner and discuss the clarity of their explanations and ask the question, "Could I replicate this procedure and get the same results?" or "Does this explanation make sense?" Students were then given an opportunity to revise their own work. Students still fared better orally.

Parents receive a monthly curriculum newsletter and have been encouraged to ask their children to explain answers and tasks. Parents are encouraged to listen for details, sequential

steps, and correct use of terminology. “Next steps” comments on the report card offer ideas for parents to use to assist their children. Parents, even those who ask for suggestions, are not taking the time to ask their children to explain the process to them. They feel that they don’t understand the math of today. I explain to them that they are helping their child to reinforce their understanding and they themselves might learn at the same time.

After attending the conference with Ruth Sutton, I was reminded that students need feedback to improve. It needs to be immediate, instructive, and formative so students have ample opportunity to improve before they are assessed in a summative manner. I gave students feedback on how they could improve their responses, through conferencing and writing responses in their journals. Some students were receptive to advice and responsive (generally the females) while others demonstrated no effort to incorporate these suggestions. This formative assessment is a positive approach because attempts are in pencil and can be improved before the summative evaluation. I heard Harry say the other day, “*Hey, I’m a 3 now!”*

Findings and Conclusions

Action research gave me an opportunity to expand my assessment processes. I videotaped students working in groups explaining how they solved problems. I walked around asking prompting questions. When I viewed the tape later, I was able to listen to my questioning strategies and encouragement of students and could directly see how they were responding to my advice. Corrective feedback was an advantageous process for writing strengths, weaknesses, and next steps for the report cards.

Upon reflection on this experience, I am looking forward, with anticipation, to incorporating these ideas into my teaching practice. I will begin early to help my students feel comfortable and confident in Mathematics. I will definitely begin the year by reviewing

problem-solving strategies and including more problem-solving in my math program. I believe that Mathematics and Language should be taught simultaneously, particularly at the beginning of the year. If students improve their written communication in Language, then we can work on their math skills in mathematics class.

I believe parents need to take more responsibility to help students achieve success at school. I'm not totally certain how this can be accomplished, but I have some ideas I would like to try. If students begin doing problem-solving at home with parents in the Primary grades and continue this practice through the Junior grades, perhaps the attitudes and interests of parents and students will be more positive.

I believe the biggest difference in my teaching practice is assessing the students in a more formative manner. Rather than conclude that they "don't get it" and include it as a weakness on the report card, I continue to help them by offering corrective feedback and providing further opportunities to improve their results before the summative evaluation on the report card.

The results of standardized tests cannot be assessed in one year. My students will need these strategies reinforced in Grade 8 and 9 and the results of the Grade 10 test will be the true indicator of the success of the program.

Improving Written Communication in Mathematics, Grade 6

George Neeb
Grand Erie District School Board
North Ward Public School
Grade 6

Research Question and Significance

My research question was**, "What can I do to improve students' written communication in Mathematics?"**

Students obtained the lowest results in the Mathematics section on last year's provincial Grade 6 test. One of the poorest results was the students' ability to communicate understanding in Mathematics. Although problem-solving and understanding of concepts were also weak, I concentrated on communication because it is embedded in all the scores. I was also concerned that, because the test is written, students who have trouble with writing are not being assessed on their mathematical ability. Most of my students are stronger orally.

"It is easier to say it verbally. In math I can never think of what to write". Student

Methodology

I planned to develop ways to improve writing by coaching students to build on knowledge that was already there and use their oral ability as a starting point to written responses. I planned to motivate students and encourage them to help each other to feel more confident about writing the provincial assessment. This would be accomplished through the following strategies:

- use a process writing approach to solve math problems

- use corrective feedback with students
- explicitly teach problem-solving steps and strategies
- clearly outline evaluation expectations
- teach the required math terminology
- replicate testing circumstances in the classroom.

In the past I had never thought of written math responses as needing the time and dedication of language skills. I felt students should just write a response and move on, without really thinking of ways to teach them to do so. I do believe that students need to improve their understanding of math concepts, but I also believe students have much knowledge that is already there but not showing up in the test results. Students need practice and encouragement in sharing in the written form. I decided I would try to teach students to write math responses the way I teach them in Language using a writing process. I encouraged them to talk over ideas with others (like prewriting), then write a response using a problem-solving model (drafting), then re-read their response (proofing), share their response with others (conferencing and corrective feedback), and finally, make any changes in ideas and edit for clarity (final draft). I encourage students to do more than one draft of their responses, just like authors do several drafts of stories.

"*Conferencing with others about my math answers helped me to notice my mistakes and help others"* Student

Although students were using corrective feedback in their conferences, I think it is still important to discuss it directly. Students need to be taught how to help others improve their work and teachers need to understand the importance of this skill and how to use it effectively. I taught students to focus on making two statements to the writer*:* "you did well,…. and you could improve your answer by……". I reinforced repeatedly that telling someone their work was good

or excellent really does not help them. Everyone can improve in some way. I would always have my students use a conferencing sheet to evaluate how well the stories they were sharing met certain requirements. Students had to staple this formative evaluation onto their stories when they handed in drafts for me to read and I encouraged them to use this feedback to revise their stories before handing them in. I thought this sheet would work for math responses so I had the class help me decide what we should look for in a question. They came up with suggestions and, over time, we realized that there was a standard practice to writing a complete math response. Then I found an actual "Steps for Math Problem Solving", which we used as a basis for our model, conferencing, and feedback form.

Students need to know how their responses are being evaluated. In class, I always have rubrics ready before the students start on an assignment so they know what I am looking for in a Level 3 or 4 answer. Using the overhead I showed students the actual rubrics for the provincial tests. Although the rubrics are very general, we had a lengthy discussion on what each section meant. When we took up the practice tests together, I modeled responses based on the rubrics sent by EQAO and clearly identified why I was doing what I was doing in the response.

Students need to buy into the importance of written communication in the test setting (and the importance of the skill in everyday life). One way was to leave Mathematics and discuss the reading section of the provincial test. I asked students to explain how they thought they would receive a reading score. Most assumed they would be reading to someone. I explained that their reading score was based on the writing they did about the story they read, the reason why we have been doing response journals all year! This helped them see that writing was clearly important.

Students need to be prepared to answer questions independently. It is important for them to realize that they will not have the corrective feedback they had in the classroom on the provincial test. In the third term, I gradually removed the conferencing option so students would solve the problems more independently.

Findings and Conclusions

Students greeted the writing process approach to math with enthusiasm**.** The class was unanimous in agreeing this not only made math journalling more fun but it actually did help their mathematical understanding. A few said it helped them to clarify their ideas and make their responses better.

> *"I liked conferencing with others about my math answers because I got to see what other people thought of my work before I handed it in".* Student

Even if the conferencing and sharing only made math more enjoyable, it was still a help because I believe the more enjoyable the experience, the more effort will be put into it.

My own practice of corrective feedback to students has improved this year. I feel more confident giving students' strengths, weaknesses, and next steps comments with marks being optional. This formative approach helps students see how they can improve as opposed to just receiving a mark and ignoring the comments. I still use summative evaluation but with corrective feedback in mind and I give students opportunities to improve their work after they have received the feedback.

In working independently in third term, I found many students still did as well in their responses because they could "conference" alone, using the corrective feedback ideas discussed in class. Students were re-reading their responses, going through the "Steps for Math Problem-solving" independently and also revising and editing. Some were even doing second drafts.

I videotaped students hard at work writing and conferencing, using the camera as my eyes. Usually I was quiet –just observing, sometimes asking questions. This gave me a wealth of information about my students. When I viewed the tapes later I found I was seeing things I had not noticed (who was working with whom, who was more on task, who was giving helpful advice). I could also listen to my own questioning and see how students were responding to me. I then showed the video to them. This offered us a process for formative student self-evaluation, teacher-student evaluation, and teacher evaluation.

I have seen incredible growth in my students' mathematical communication. We still have a way to go but I believe students have become much more confident in solving math problems and have found math to be more enjoyable and less frustrating.

By joining the action research project, I was encouraged to ask questions of my own teaching and then develop ways to solve these questions. Through discussion with my students and peers I believe I have implemented some techniques to help students that will become part of our everyday classroom programming.

I had the students give feedback on math this year. They made some powerful statements about their own learning.

"*Problem-solving is my favorite part of math because it is both fun and challenging."*

"I find it easier if I have discussed the problem rather than having to do everything in my head."

" I have improved in problem solving. When I first started I was bad at it. Now it's my favorite part of math. I don't know how I improved, I just did."

Improving Writing Skills

Julie White
Grand Erie District School Board
J.L. Mitchener Public School
Grade 4

Research Question and Significance

My research question was**, "How can I improve the writing skills of my Grade 4 students?"**

The data from the 1999 Grade 3 provincial testing indicated a strength in writing among my Grade 4 students. However, I was not witnessing this level of success in daily writing activities. More specifically:

- identified students all scored Level 2's in communication. They met the expectation for term one, and their first term report matched the Grade 3 provincial results. However, they had weak spelling and grammar skills and their ability to use evidence also needed improvement.
- Students who scored Level 3 on the provincial testing were consistently achieving Level 2 on written assignments in the first term of Grade 4.
- Students that scored Level 4 on the provincial report card generally were just as successful during term one of Grade 4

These observations immediately concerned me because, although students scored well on provincial testing, their initiative toward writing in my classroom was low. Students scoring

Levels 1 and 4 were not making any improvement and students scoring Level 3 were dropping to Level 2 in the first term.

Methodology

The writing my students do in my classroom could be improved in terms of detail, scope and the use of conventions. I feel strongly that writing is an important skill for students to develop. I surveyed students' attitudes towards writing. They need to have a more positive and productive attitude towards written work. With the right perspective and tools, all students can find success and enjoyment in putting their thoughts on paper.

In order to bring my classroom practice and student success closer to my values about writing, I set goals and an action plan to accomplish this. I wanted to:

- increase enthusiasm for writing
- teach the importance of writing
- increase the detail students put into their writing
- encourage and foster creativity in writing
- use corrective action in the form of strengths, weaknesses, and next steps.

I decided I would start by modeling the writing process in a collaborative writing session with my students. The process took several days but it showed students that the writing process cannot be rushed. I also felt it would create enthusiasm if I could model the joy and fun of creating. All students would experience the success of writing an interesting and well-organized story as a team.

Next, I introduced a story map to help students organize ideas prior to writing the rough draft. Along with the story map I gave students a writing prompt to encourage creativity and help those students who have difficulty coming up with ideas. The writing prompt had two

illustrations - one for the problem and one for the solution. Students used the story map to organize their plots around the two illustrations. Students were able to personalize their story with their own characters and events.

I wanted to use corrective feedback in the form of strengths, weaknesses, and next steps to improve my students' writing. Since students were much more focussed, I was able to conference individually with them. I wanted to make the evaluations anecdotal. The conferencing involved me reading their story aloud to them, making corrections together, and recording strengths, weaknesses, and next steps. The students produced two next steps they wanted to focus on for their next story. They also had to continue to be diligent about the things they did well.

After struggling with the writing process, I noticed students were interested in picture books so I decided to develop some shorter writing. I read the books aloud to the students and we used this to cover making judgements on the basis of evidence (reading response) and improve creativity. Students wrote a script for the meeting between Dorothy and the Wizard in the Wizard of OZ, practiced their conversations out loud, and then brainstormed ideas before writing. They were given an opportunity to re-write their responses. Students completed several responses to literature this way.

Findings and Conclusions

After the collaborative writing session, students were eager to create a story independently that was just as interesting as the one we created. They slowed down the pace at which they normally wrote, and as a result, their final drafts contained more detail and fewer errors. They still had difficulty following the planning stages. This may have been because they were following the plan on the blackboard instead of the story map I had given them. Although

they were enthusiastic about inventing their own plot, they still had difficulty deciding on a problem and solution with enough detail and depth.

After giving them the story map and the prompt, students were more successful. They continued to work slowly and they took care to avoid errors. They liked the story map because it showed them how much they needed to write and it made their stories longer. The prompt meant they didn't have as much difficulty deciding what they wanted to write. I observed that students didn't become anxious or preoccupied during writing because they had an idea and a plan.

Initially, reading responses were short and unimaginative and students seemed to revert back to their old habits. I noticed that my students always seemed more interested in picture books because they had vivid pictures and because they could read them more quickly. It was an issue of attention span and helped to explain why initiative towards writing was low. After the brainstorming and feedback sessions, students were more willing to re-write. They had a basis of comparison between what they did and what they could do. I used this leverage to prove to them that they could all be successful if they didn't rush the process. Students have now completed several responses to literature and have been very successful at producing Level 3 and 4 work. I have also realized the importance of giving students opportunities to improve. I now have requests from students to "try again," or "take a little more time to do a better job". This also shows me they are definitely enjoying writing more and are able to identify their own strengths, weaknesses, and next steps to improve their work. Many students are spending extra class time creating new stories they plan from start to finish independently. Students use these as part of their portfolio and at the end of the term I allow them to choose 5 stories they feel best display their writing ability. I continue to use prompts to initiate stories and emphasize alternatives for parts of the story (e.g. character development instead of problem and solution).

I surveyed students at the end of the term and compared their responses with those at the beginning of the year. There was an increase in the number of students who enjoyed writing stories. They felt that they were putting a better effort into written responses. Students were able to explain strengths, weaknesses, and next steps in more detail and were actively engaged in using corrective feedback. There has been a marked improvement in students' writing and other staff members have commented on the remarkable detail and organization in the stories. My own journal entries show growth in more positive attitudes and increased success in writing.

I plan to implement shared reading sessions to generate more enthusiasm. By allowing students to share their stories, I feel that they will continue to take pride and put forth a good effort. I also want to introduce additional stages to the writing process that will encourage students to develop their own creativity for story writing by brainstorming independently (using a graphic organizer developed by Janet Rubas). A format for editing will be developed that replicates the conferencing process so students can conference with peers during the editing and revising stages before submitting their work for assessment. I want students to become more aware of the expectations and develop their goal setting skills.

In September, I plan to use more flexible, shorter, and more frequent writing periods in order to maintain motivation. I also want to introduce letter and class newsletter writing.

I plan to modify my assessment so my mark book reflects corrective feedback and allows students the chance to change the mark when a new skill has been achieved. Summative assessment will be avoided until the end of term. I want to assess collaboratively with students and provide each with a mark book so that their grades and formative comments are available to them all year. This will allow them to do personal goal setting.

Lastly, I plan to share my research in a professional development workshop in order to gain more insight into other classrooms and the procedures that are working well for my colleagues. Hopefully, what I have learned will be an asset to their programs as well.

Gender Equality and Math Lessons

Diane Clark and Liana Thompson
Grand Erie District School Board
Lynndale Heights Public School
Grades 6 and 7

Research Question and Significance

Diane's research question was, **"What can I do to make the classroom less gender biased during math lessons so that both boys and girls feel comfortable and challenged with lessons, assignments, and the curriculum?"**

Liana's research question was, **"What can I do to foster positive self-esteem and create awareness of gender issues to improve student performance, especially in math?"**

When looking at the 1999 EQAO provincial assessment results for the Grade 6 students, the varying attitudes of the males and females towards Mathematics were quite surprising. The percentage of girls who, on the questionnaire, stated they like math was a disturbing 33% whereas, 73% of males like math. Even more striking was the difference in attitude when asked if they were good at math (girls 33% and boys an overwhelming 80%). This did not seem right because we knew that within that group of students we had many very strong girls who appeared to be confident when doing math, felt comfortable when volunteering answers, wrote long explanations in their math journals, and achieved success on daily assigned work and tests. We then examined the actual levels of achievement in the EQAO assessment and our suspicions were confirmed: More girls than boys had achieved Level 3 or 4 on the math components of the assessment! Why did 67% of the girls think that they were not good at Mathematics?

It was encouraging to see that 73% of the Grade 6 girls do not worry about the reaction of boys when answering questions in class. The number decreases to 43% in Grade 7. Forty per

cent of Grade 6 girls preferred to be paired with a girl and 38% preferred working in all-girl groups. By Grade 8, 40% of girls preferred to work with other girls. Sixty-seven per cent of girls in Grade 6 and 57% in Grade 8 liked math but 73% of Grade 6 girls and only 43% of Grade 8 girls felt they were successful in math.

In contrast to the girls, 100% of the boys in Grade 6 and 7 are not concerned about responding to math questions in the presence of the girls, although it drops to 92% in Grade 8. When asked if they liked math, the number increases from 71% in Grade 6 to 90% in Grade 8, while 86% of the Grade 6 boys and 91% of the Grade 8 boys feel successful in math.

When we looked at the attitudes towards specific strands and math activities we began to see some interesting patterns emerge. Grade 6 girls chose graphing as their favorite math activity- it was easy, fun and they felt creative when graphing. Least favorite was word problems, then math journals. This surprised us because our girls loved to write and wrote extensively in the journals. They explained this by saying they did not like to explain themselves and found it difficult sometimes to explain something mathematical.

When we added the data about the boys, it was interesting to see the gender differences. Boys chose problem solving as their favorite activity and they liked graphing. Math journals were their least favorite activity. The resounding reason was their dislike of explaining anything in detail.

After some discussion, we noted that students' perceptions about mathematics were not indicative of actual performance. We found that at Levels 3 and 4 the girls slightly out-performed the boys. The boys perceived themselves as strong math students, even though success was moderate compared to the girls. The need for action had been established.

Methodology

After giving the research topic much thought we formulated a plan of action which would provide us with some insight into attitudes of the students with regard to math. We immediately did the following:

- called a meeting of all Intermediate Division teachers to discuss our concerns and decided collectively to change our TAG (Teacher Advisory Group) groupings to single gender for the second term so that we could focus on oral responses of female students through group discussion
- arranged a meeting with Bob Ogilvie, consultant for Grand Erie DSB, who came to our school and gave us insight into the attitudes of females towards math and science; he also left us valuable resources to read
- created a math questionnaire for all students in Grades 6, 7, and 8, which was administered in the single gender TAG group
- read and summarized for staff, articles on the varying reactions of boys and girls to math and science activities
- shared data from the questionnaires with TAG groups, staff, parents, and school community and prepared a list of Christmas gift suggestions for parents that would encourage interest in math and science for boys and girls
- combined the results of the questionnaire with first term report marks for analysis
- planned ways to foster more positive attitudes toward math among our female students (using corrective feedback on gender attitudes constantly in class; TAG group discussions about test scores, self-esteem, traditional and non-traditional careers, and classroom environment; posting newspaper articles and web sites about talented females and breaking gender stereo-

types; single gender work groups in term 2 and mixed groups again in term 3; emphasis on math problem-solving)

- participated in the "Act, Reflect, Revise" action research conference to promote awareness and obtain feedback on our research from other researchers

Findings and Conclusions

Diane wrote: Promoting a change in attitude had to come from me. So, I made it a point to bring in and discuss with the students, news articles about talented females and women breaking stereotypes. Soon several female students were bringing in related newspaper and Internet articles and looking forward to boasting about, *"one of their own.*" I was thrilled when 5 students of both genders brought in an advertisement promoting a computer for girls (covered with Barbie decals) and one for boys (covered with Hot Wheels). They were incensed to think adults were trying to stereotype them. Similar discussions resulted over trading cards.

Concrete proof of a slowly developing change in attitudes on the part of girls in my class came about when speech topics were being chosen in January. I was thrilled when more than half the girls and two boys researched famous Canadian females!

From the outset, it was obvious to me that the girls in my TAG group were relieved to discuss their feelings about math in an all-girl setting because they felt the boys monopolized the conversation in regular classes. That was something I was going to have to pay close attention to in my classroom. Based on my reading and the results of the discussion in the TAG groups, I structured single gender work groups in term two. The girls loved the change because in the past I had always insisted that there be a mix in each group, using the reasoning that the stronger would assist the weaker and the more-focussed females would positively influence inattentive males. With the single gender groups, I saw the girls gain confidence daily as they helped each

other, asked questions, and worked collaboratively. Girls who were hesitant and reserved contributed to class discussions and were more willing to share ideas with their peers. In February, in social studies, we were playing a game of Jeopardy in preparation for a test. I placed students in mixed gender groups so that I could see if any change in group dynamics had taken place. I was pleasantly surprised. In the Fall the boys usually took over the groups and did most of the talking. Now, in February, the reverse was seen. Girls, who I had known to sit back and just watch the group's proceedings, were now the leaders of the group. The girls were deciding who would answer the questions and how to organize the information during the game. It was truly amazing to see these girls exude confidence with their peers! Working in single gender groups had certainly helped the girls in my class.

Problem solving was determined to be the least favorite aspect of the math program for girls. Because it is woven through the math curriculum, I decided to focus on it. Amid groans from the girls and the boys, we began an intensive unit in January in which problem solving strategies were explored and used repeatedly with word problems. We worked on problem solving in single gender groups and after two weeks I began to notice a change in attitudes and approach to work. Students began using the terminology ("Yeah, but if we use a t-table we might see a pattern emerge"). They appeared less frustrated with the question*s.* My weaker girls were speaking excitedly about the problems. It was working! When the unit was over, they asked if we could devote one day a cycle to problem solving and eagerly anticipated the problems awaiting them. Girls, primarily, demonstrated the confidence to solve work problems without much teacher intervention. This was a refreshing change from the Fall when I had assumed that the students had arrived knowing how to solve problems, and had seen frustration because they

lacked the basic skills. Now, half a year later, they had both the know-how and the desire to problem solve.

Liana wrote: At the TAG session, I discussed the questionnaire results with the girls, who predicted the results accurately. When asked why they assumed the boys would respond so favorably to the questions, the answer was, “Boys think they’re great," "They have huge egos,” and “They think they can do anything.” Then I prompted the girls to explain why girls feel so negative to math in general. The overall response was, “It’s boring,” “It’s too hard,” and “What will we use it for in the future anyway?” I continued the discussion by providing the overall summary of actual performance and they were quite shocked to learn that the girls had out-performed the boys in math. Then I posed the question, “Why do girls have such a negative attitude towards math?” No one could answer. The girls themselves did not know why they didn’t like math or why they felt they did poorly in math. Upon reflection, I realized that in interviews with parents, especially mothers, they often complained that they couldn’t help their child with math homework because, “It was never a strong subject for them.” The project became overwhelming at this point as I realized not only student attitudes but also societal attitudes needed to change. During TAG discussions, girls admitted that self-esteem was low for girls at this time in their life and that boys seemed quite confident and self assured at the same stage. Many girls admitted that they would like to be lawyers or police officers but felt these jobs were mainly for men. They responded positively to the suggestion of a career fair for non-traditional jobs. The more we dug the more I found that low-self esteem in general was causing problems in achievement. Boosting the self–esteem of as many girls as possible seemed to be in order.

During TAG groups I assured them that they were all strong, interesting people with much to provide in classroom discussion and encouraged them to build on this strength and begin to take risks in the classroom by participating more in math, contributing ideas, and taking on leadership roles.

It was interesting when we went into single gender groups in term two that the Grade 6 girls welcomed the change. The Grade 8 girls didn't say much verbally but a slight increase in confidence was noted during discussion and brainstorming sessions. The Grade 7 girls, however, were indignant when they found themselves in single gender groups and responded that, "This is going to be boring," "We need the challenge of the boys in our group," and "In the real world we'll have to learn to work with boys." At the end of the term, a meeting was held to discuss anecdotal records and achievement. Overall the Grade 6 girls were achieving higher marks after working in the single gender groups. The boys in the classroom maintained their self-confidence but fewer achieved Level 3 in term 2 than had in term 1. The Grade 8 girls showed much improvement in their self-confidence when working in single gender groups but maintained the same achievement levels. The Grade 8 boys maintained their confidence but their marks were slightly lower. The steps taken toward risk-taking behavior seemed lost when girls returned to the whole class environment and the boys dominated the class discussion. The self-confidence and academic achievement in Grade 7 girls remained the same, while the boys in Grade 7 weakened slightly academically with no difference noted in their attitudes. The Grade 7 classrooms were very happy to find that single gender groups were no longer necessary after term 2.

How could we expect to change attitudes developed from 11-14 years of cultural conditioning? And, by changing school attitudes, did we have any effect on home attitudes? And

whose attitudes were we changing anyway- the girls' or the boys'? I realized the need for teachers, other colleagues, and parents to be aware of gender stereotypes, sexist language, and other so-called "power" bases that exist and influence student performance.

Working with Bob Ogilvie as critical friend, we were assured we were working effectively with staff by discussing our research and asking them to take part when possible. He cautioned us not to "over do" it. We encouraged those staff members who were interested to continue to be aware and to strive for equity in all activities. Many girls were now being asked to stack chairs, dig sand pits, and move paper stacks, while boys were being asked to do jobs such as decorate classroom bulletin boards. The school community was made aware of our project through such things as the bulletin boards and Christmas gift suggestion list.

My practice has been modified in several ways. I always thought I was liberal-minded then one day I caught myself in a big slip-up. On the first day of school, I generate a classroom discipline policy by using the quote, "No man is an island." Well into my research it dawned on me what I had done and I quietly changed "man" to "person" without announcing what I had done or why. The students noticed immediately and I allowed them to discuss it briefly among themselves. They invariably concluded that "man" was sexist and I knew my goal had been reached.

I am continually providing activities for female students that would previously have been considered "male" jobs and vice versa. I encourage all students to find thought-provoking stories in the media that are related to gender issues and the breakdown of gender stereotypes. I allow students to choose groups in which it is comfortable for them to take risks. I take care to ensure that I am not using sexist language and ask the students to do the same. If they ask why, a class

discussion regularly ensues. I discuss my methods with staff members in an informal setting and ask them for feedback and ideas of how I can further promote this awareness.

Our next steps seem limited compared to the vast nature of our question but we have made strides in ensuring that girls experience increased confidence and self-esteem in our math classes. We plan to continue with our research question. Our next steps are:

- arrange for Bob Ogilvie to come on May 15 to inservice staff about gender issues in the classroom
- plan a self-esteem luncheon series for the Fall 2000 in which female role models from the community will lunch with Grades 6, 7, and 8 girls
- attempt to enroll some of our students in Camp Trillium's GIRL POWER camp (Growth, Independence, Respect, Leadership and Self-esteem).

Diane concluded: Changes will continue to take place in my classroom as I read more literature and implement new ideas. The feedback/feed forward philosophy has enabled me to pinpoint an area requiring closer attention and then provided me with the tools to foster improvement and change in my students and teaching practice.

Liana concluded: My research seems to keep growing as time passes. I am certain I will continue to focus on these issues throughout my teaching career and I hope to make many others aware of and committed to making positive changes in their students and communities. With this change there is the expectation of higher marks to be attained by all students and an ever-increasing awareness of equality and the contributions to be made by all individuals.

Effective Writers Grades 5/6

Karen Dunn
Nipissing-Parry Sound Catholic District School Board
Corpus Christi Catholic School
Grade 5/6

Research Question and Significance

My research question was, **"How can I improve my teaching practice to help create more effective writers?"**

Students did well on the 1999 test and my goal was to maintain and improve performance levels on the 2000 tests. It was evident students had more dramatic needs this year. A high percentage of students started in French Immersion and missed stages of language instruction in their mother tongue.

After studying results from baseline writing samples, it was evident that the students' writing lacked various components that EQAO valued. Students' writing lacked a voice and a variety of sentences. Plots were simple and not always clear. My job was to address these problems in a climate that would have students take responsibility for their own growth.

Methodology

First I collected baseline samples of my students' writing. They wrote on their own and I tried not to shape their thoughts and writing behaviours. I marked the stories using the rubric from the Grade 6 testing, and gave feedback based on the exemplars and anchor booklets. Peer marking was my first corrective action step. Other teachers were involved in the marking. Staff

members often share planning but assessment, the critical component, has traditionally been an isolated activity. This peer marking provided healthy conversation and it confirmed the need for universal marking standards.

My next step was to focus on effective teaching practices to assist the development of writing skills for my Grade 6 students. Once the data was collected, each student and parent participated in a formal interview to discuss the student's writing achievement by assessing strengths and weaknesses against the exemplar and then creating a plan of action that included a home link. I quickly realized I needed to adopt good teaching practices to provide assistance. I had to keep my perspective and not become discouraged. These practices included more writing on a daily basis to increase our engagement in writing, integrating science and social science to increase non-fiction writing, switching from a writing folder to a writing notebook, and creating mini lessons on each aspect of good writing (e.g. voice).

Ruth Sutton says "feedback is a gift." With this in mind I started to take a look at how much actual feedback the students received and if it was productive. I found that I was spending time with the good writers because they demanded it and not with writers who actually needed my help and had perfected the art of hiding. It was with this in mind that I started to design very specific feedback sheets that reflected the rubric and that actually meant something to all learners.

Next, I needed to teach students to examine their reading as sources of good writing and their writing through the needs of a reader. *"*Read like a writer and write like a reader.*"* My students are encouraged to recognize and emulate good sentences, words, and phrases. Our independent novel study provided good models for the students. The talk within the reading lesson, especially for high needs students, provided a model for writing conferences. We took

time to share passages and note good writing. Talk, in reading, is key to establishing good story lines, behaviors, and patterns within the written word.

We love doing what we are good at and time seems to fly when we do. One of my unsuccessful writers, has avoidance techniques down pat. She loses her stories, leaves her book at home, or says nothing and hides in the corner and tries to draw for the writing period. She does not live a charmed life and the extent of her hardships are very private. The day we read and wrote about homeless people was a revelation for her and for me. She was on task and produced a piece of writing that screamed with writer's voice. She wrote because she knew the topic and found herself in the literature. (Fly away Home) She also had a model to write from.

Findings and Conclusions

During the peer marking, I learned a great deal about how the writing rubric influenced the writing climate. The detailed achievement summary sheet used during the first term interview and the parent–student interview are worthwhile. They helped to alleviate apprehensions about the Grade 6 testing by preparing the parents and students for the test.

The daily writing allowed the students a better chance for more productive feedback. Even though it was physically impossible to conference with each student each day, students now, at least, got weekly conferences. I found the increased writing time allowed me to be more active in providing feedback and my accountability and assessment accuracy was increased. The mini lesson was a great opportunity to incorporate a variety of writing exercises and highlight aspects of the marking rubric. The mini lesson is a critical component that establishes the foundation for good writing. It is a teaching tool that makes a difference. The skills, mini lessons, demand, and short writing activities were my saving grace as positive corrective action steps.

The feedback sheet brought a new dimension to our writing sessions. It forced the students to be more reflective of their writing. The higher-level writers were now more independent and the ones who needed me had a framework to formulate questions to ask for help. The weaker students were now asking for help- not hiding. Their talk was also changing. I remember one student saying, "But Miss, I don't use complex sentences in my writing." The feedback sheet helped raise the accountability for all learners. It forced writers to engage in their own writing and to demonstrate skills taught in class. The feedback sheet should be designed around the needs of the writers and should be a transitional tool to take the writers from one level of writing to another.

These stages have created two fundamental differences in attitudes towards writing and the writing conference. First, students now realize that they are responsible for the improvement of their own writing. Second, a final draft is more than just a neat copy of the first draft. They write in a culture that now expects talk about their writing. The mini-conference is a great opportunity to nurture the heart of young writers and provide praise and encouragement. I read students' writing in progress, often read work orally to the class, and had the others brainstorm and help students out of their writing difficulties. Sometimes I just shared well-written paragraphs. This was an effective way to manage class discipline, model interest in their accomplishments, and be an active member of the writing community.

It is evident that good readers make good writers. One needs to have many good examples before students can create their own world with words. It is imperative in our writing classrooms that our topics have meaning to our students. My students taught me to pay close attention to all writers and the stories that live inside us all.

My recent path of reflective teaching has reinforced the need to be conscious of the strategies I use to teach. In the current educational climate, teachers have been forced to deal with large amounts of rapid change. I find I can make unconscious shifts from focusing my attention on "what to teach" and leaving the "how to teach" as an after thought. This is something I must be conscious to avoid.

Writing is a life-long skill that requires good teaching and practice. I found, over the last few months, my attitude and practice of teaching writing has made a considerable change. Writers must be attentive to their audiences as they entice their readers into worlds of words that they have created. Teachers must also be attentive to the needs of their students and to the fact that our teaching climate truly dictates our teaching practice. I find now that I teach more specific skills and watch the small steps being taken by the young writers. I have switched my timetable to accommodate daily writing. I use a notebook called daily writing to help organize my students' work and record lessons being taught. Science and social studies expectations are used to teach non-fiction writing. The climate in the writing classroom holds the student responsible to demonstrate skills taught and encourages them to develop effective self-editing skills.

The real journey of the writer never really stops. It is an ongoing life skill that needs to be rekindled by strong, supportive, well-placed teaching scaffolds. As for my next reflective journey, I feel the need to investigate the area of reasoning in the writing classroom.

Effective Writers in Grade 4

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Our Lady of Sorrows Catholic School
Grade 4

Research Question and Significance

My research question was, **"How can I improve my teaching practice to help create more effective writers in my Grade 4 class?"**

When I analyzed the results of the Grade 3 testing from the previous spring, I identified the organization of ideas in writing as an area of concern for my students. In September, before the action research project had begun, I had already begun to focus on improving the organization of students' writing using a series of children's books as models. As I read each book to the students, I focused on each organizational element (title of book, characters; setting; plot; summary and conclusions). After reading each book, I gave each student a piece of construction paper that was divided into sections - one for each element. Then, we analyzed the elements of the story and filled in the spaces on the construction paper. During this time students were also writing stories using story webs and following the story process (brainstorm with web, first draft, proofread, peer edit, teacher edit, and then final copy).

I wanted students to use the organizational elements modeled in the books to write their own exciting adventure stories. However, I found that my students' writing did not improve significantly as a result. Consequently, as the action research meetings progressed and we

learned a number of feedback/corrective action techniques, I wanted to apply these techniques to my own action research question.

Methodology

The first thing I wanted to do was to have the students become aware of my curriculum expectations. Together, we brainstormed all of the things that go into the making of a good piece of writing. I thought that, if the students could give me the criteria, they would have a better understanding of what was expected from them. Interestingly enough, the students were able to provide all of the criteria of a good story. It was one of the best lessons we had ever had!

I created a rubric out of the criteria developed by the class. I told students that this sheet would be attached to each of their stories and would make it easy for them to identify their strengths, weaknesses, and how to improve. I also told them that the mark on their story would be written in pencil and would not be final until they decided it was. They would have a chance to improve their grades and I would help by re-teaching areas in which they needed to improve. In January, I added conferencing to talk through the evaluation of the writing and to suggest improvements verbally as well as in written form.

I also started to have students write daily for at least 15 minutes on topics I gave them. The topics were related to current areas of study. As well, we began a math journal. On several occasions, I modeled what should be included in a math journal and the "pictures, words, and numbers" writing format to follow.

One assignment was to write a two to three-minute speech. Before the students started, the whole speech process was modeled including how to brainstorm topics, develop a chosen topic, and develop an outline for a beginning, middle and end. I also modeled how to write a book report. I did two book reports together with the class and then had them do one on their

own. Another strategy I tried was involving the learner in peer editing and peer and self-evaluation. In the spring, I modeled how to do a Science Fair Project from finding a topic and determining the “big question," to writing the summary and conclusions, and creating an effective way to display results.

Findings and Conclusions

Overall, I felt frustration about the results of my efforts to improve the organization of students’ writing. Unfortunately, few students accepted my offer to re-mark work after they had made revisions. There was one student at Level 3 who was interested in making changes. However, many were quite satisfied with their Level 1 or 2 results. I was surprised at the lack of interest students demonstrated in making corrective changes in their work. After introducing conferencing, I wrote:

> We have been working on our stories this week, and I have been conferencing individually with the students. I am giving them written and oral feedback with a Level and suggestions for improvement. A lot of the stories I receive back do not have a lot of changes made to them. So I continue to give them back to the students. Sometimes I wonder if I need to try all these different strategies when the problem seems to be a lack of work ethic and interest in trying to improve. The students generally seem apathetic. However, I will persevere and try new things.

During the unit on speech writing, even after all the modeling, the quality of the speeches was not very good. The very area I wanted to improve on -the organization of ideas- was still at an overall Level 1 or 2. Only a few students performed at Levels 3 and 4. Additionally, I found that the students tended to evaluate each other too easily. For the speeches, a clear rubric was

written on the board and after the speech, we voted on the levels. Often, students just gave each other Level 4 even if the work did not meet the criteria.

I also found many students did not seem mature enough to take peer editing seriously. They quickly read each other's stories and decided they are great, even if they did not make sense. Editors circled a few spelling errors and then the writer handed in the story without even fixing those mistakes. I gave work back sometimes two or three times until it was finally corrected. Next year, I will give them peer evaluation feedback sheets asking specific questions about the writing.

There was only one person who received a Level 4 on the book report. Two students received Level 3s. The students still had a difficult time dividing the book into beginning, middle, and end and deciding on the most important events.

There was, however, some evidence of improvement. In the daily writing, students demonstrated increased organization and creativity. I started to see imagination in some students' work. However, I found that the daily writing activity helped the top students accelerate more than others. The lower level students did not improve as much.

The quality of the Science Fair projects was good. I had many more Level 3s and 4s than 1s and 2s. This project was very hands-on with a lot of teacher interaction. At that point in the year, I had a student teacher, an early childhood education student, and a volunteer helping me. All of us worked with the students. We questioned, gave feedback, and helped put the projects together. This intense adult involvement helped keep the students on track.

Despite seeing growth in some students doing Level 3 work, I am still having a problem with the organization of writing particularly for students achieving at Levels 1 and 2. Many rush through their work regardless of how long they are given. When I give stories back, the students

still do not do a lot of editing and revising. At one of our last meetings we were asked to bring a summary of our action research. After much reflection, I found that perhaps I have been asking the wrong research question. I wrote:

> I am starting to wonder, if I am focusing on the right thing. Perhaps I need to look at the students' levels of apathy towards learning before I try to improve writing habits. I have tried a number of proven strategies but the students do not respond. They seem to think that whatever they put down on paper is the final product and the best they can do.

At this point, I realized the important role classroom climate plays in student learning. I have a large class with 32 students. Twelve are identified as exceptional. Four of these are on medication for Attention Deficit Disorder. Parental support is limited. I run a well-managed classroom in terms of discipline but what I would like to change is the way the classroom environment is structured. I would like to have more centers that focus on different multiple intelligences in order to motivate the students to learn. Next year, an important part of the beginning of the school year will involve teaching students how to work in groups, to be responsible for independent work, and to find meaning in the work they complete.

In the future, I would organize my action research differently. This time I tended to focus on my whole class. In the future, I would focus on a small group of students with a very specific question geared towards that group. I would like to work with this small group of students for a specific amount of time each week and use the teaching strategies that were mentioned earlier.

Using Modeling to Improve Student Use of Clear Terminology in Grade 2/3 Writing

Linda Gordon
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St. Gregory Catholic School
Grade 2/3

Research Question and Significance

My research question was, **"How can I use modeling in my class to promote the use of clear concise terminology in written responses and oral presentations?"**

Our students seemed to be having trouble moving from one level to the next. They are lacking the independence and the necessary skills to do this. Obviously, this is something on which our school needs to focus.

I decided to focus on the science and the social studies areas and look at the language and the terminology students used in their written and oral presentations. I quickly discovered that the subject areas were ideally suited to this type of activity as the students participated in a wide variety of activities that required presentations, independent research, group research, and activities.

Methodology

The first problem that I encountered was creating a benchmark for student learning at the beginning of my research. I was currently working on a social studies unit and we were designing independent maps of either an urban or a rural community. As a class, we had made a 3D map of an urban community and we had discussed the characteristics of both types of

communities extensively. I believed that they knew what a legend was and that certain colours and symbols represented certain things. I was mistaken. The student I chose to follow was a high needs student who required a lot of assistance and re-teaching. Using the student's original maps, I had my benchmark. I would begin my data collection by using modelling and ensuring that the students understood the assignment and terminology used. I would use the mapping assignment and allow the students an opportunity to improve their marks and to provide them with the expectations for the assignment before hand. Together we would make up a new rubric and this would allow me to model samples as we went.

This is the plan I followed. I used the mapping assignment I had used as a benchmark for growth. As a class we generated a simple rubric and I had the students help me mark the sample assignment with the rubric. They were familiar with rubrics but had never before made one themselves. They gave their map to another student to evaluate and then again to a second student. They met with their peer evaluators and conferenced on how they could improve their work. They had an opportunity to make corrections for improvement. The map was evaluated again and then another chance was provided for improvement. The cumulative activity was a home mapping assignment and an oral presentation. The students had to explain why they gave a mark and provide the presenting student with suggestions for improvement. This was done immediately. Then the students and I met for 2 minutes and we looked at how they had evaluated themselves (they had to give themselves a mark on the evaluation sheet prior to presentation), how the class evaluated them, and how I evaluated them. I was excited and wanted to continue on with this type of teaching.

In our Energy strand I gave an assignment that had each student writing a short essay on one type of energy and its uses. Normally students would be assigned the topic and then allowed

to work on their own; however this would not help me answer my question. Therefore, as a class we did one together first. We chose to write about nuclear energy and as a class developed the marking rubric which was used by everyone. Then we gathered material together and generated a class note. I had already completed a cover page and I put the note on an overhead. As a class the students evaluated it, providing areas for improvement and how we could move this writing piece from a Level 2 to a Level 3.

I was asked to write about how I taught the students to use and write rubrics and how doing this has saved me valuable time away from marking. I didn't think that I could respond to this because I had no idea how I did it. My colleague suggested that I have the students help me with this and that is what I thought I would do. However, they were just as stuck as I was on how to approach this. We talked about it for about ½ an hour before I remembered a clapping exercise that I had done at a seminar and we tried it in our class. After recess they were ready to write. As a class, we defined a rubric and what we like about them.

Findings and Conclusions

My research helped my students feel better about what they were doing, saved me time, and was of benefit to my personal growth and that of my students and colleagues. I quickly found that my students' level of confidence and overall excitement improved and that I had transferred some of the responsibility for learning to my students. This increased not only their participation but the quality of the work they handed in. I had never felt better about teaching.

I was amazed at how hard the students worked on the mapping exercise and how they tried to be fair and honest with their peers when they were conferencing and evaluating each other's maps. The student I chose to follow originally received a Level 1 on her map. It was incomplete and had few details. Many of the items now on the legend were not there originally

and she had not coloured her map. Her finished map received a high Level 2. I wondered at this point how this activity would affect how the student would do on the final test and home mapping assignment. I wrote in my journal the following entry, *"*I find that while it took much longer to complete this activity, I covered more expectations than I thought I would and the students have a clear understanding of what is expected and how to do it." The class presented their maps. The marks and test scores proved the modeling and earlier assignment really worked. The marking rubric was posted in the class and the students evaluated each presentation on this cooperative marking scheme.

What I quickly found was that the students were accurate in their self evaluation and that I had no marking to lug home. I wrote in my journal, **"**Amazing. Not only did I have no marking to bring home, but the students and their parents really understood their marks." I followed this up with a letter home containing the rubric and their child's mark. The parents indicated that they really appreciated this and that their children could explain what they could have done to receive a better mark. The student I was following received a Level 3. I found that the students were becoming very confident and were able to identify areas that needed improvement without prompting. The students then completed and presented their own essays. They were great. I wrote, "I found that they were all really well done - only 2 Level 2's and 1 high Level 1. The remainder were 3's and 4's. A continual bonus I am finding is that the students marking together means my marking is done. This is a bonus that is unexpected."

I also noticed that a clear transfer of terminology was happening from math to science and vice versa. When writing up their observations, they were using 1st, 2nd, next, then, and finally statements without being prompted. "The increased use of rubrics and use of greater

modeling in the classroom is reflected not only in the marks but in their growing confidence." Students who would never participate before are now volunteering.

During the clapping exercise, the students immediately identified why the exercise wasn't fair for everyone and why knowing what the expectations are before hand helped to improve their performance. I was really excited about their responses and felt renewed in this project. I talked to the Grade 6 teacher and she asked me to do it with her class. They came down to my room and my students were an audience for their experience. I was amazed when one of my students said, **"**They don't understand criteria." At that point I knew that what we were doing was not only worthwhile for me but also the students were continually growing.

After we made up the rubric, one student stated, "Now I know how you give us our mark." I was surprised because I had given them the marking rubrics before and assumed they would understand how to move from one level to the next. First lesson - do not make assumptions. One student said, "I like rubrics better this year because, when we were in Grade 2 the teacher would just tell us what she was marking us on and she would make the rubric for us. We didn't really understand it. Now we understand them because we make them together."

This is my second year using rubrics; however, I have never used them to the degree that I am now using them. I find that the students are now more aware of what is being marked and what exactly I am looking for because not only does creating the rubric together allow for them to be more aware, but it also provides me with further opportunities to model the correct responses.

Marking has also become much easier because we have already created the marking rubric and the class participates in the marking wherever possible. Another benefit is that the parents are more aware of the process their children are going through and know exactly what

the assignments are marked on before hand. They appear to have greater understanding of where their children need to improve and what they can do to help. Modeling responses and allowing the students opportunities to improve their marks has had a definite carry over into their independent assignment and test results. Finally, I am finding that I am not only meeting my unit expectations but I am also getting better results. I feel good about what I have been accomplishing in my classroom.

Promoting Clear Concise Terminology Use With Modeling in Grade 5/6

Marg Kelly
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St. Gregory Catholic School
Grade 5/6

Research Question and Significance

My research question was, **"How can I use modeling in my classroom to promote the use of clear concise terminology in written responses?"**

Even before the EQAO, Grade 6 testing in May 1999, I had the persistent, gnawing uneasiness that something was not up to par. The majority of students in my class did not display an eagerness to learn or improve. Worst of all, I sensed inadequacies within myself. I was running out of the regular "things to try." There must be something, somewhere that I could use to spark their interest, their creativity, and their enjoyment of learning.

I felt the crunch in October 1999 when the EQAO results were released. How many 1's and 2's could fit on a page? In going over my class results with our new principal, I saw no real surprises. There was one student who was a shining example of Level 4 work and a few Level 3s but, basically, what the class had been demonstrating so nonchalantly in daily class activities they demonstrated in the test booklets. It just looked so much more awful in this particular comparative format. This year, I had a whole new crew of Grade 6s and more support materials in the form of texts and equipment. The gnawing question remained, however, "What can I do better to prepare this group for EQAO testing?' This class had half its members on IEP's! Some

were unable to read much beyond Grade 3. Writing skills and penmanship were just not there for a few of them."

Methodology

After listening to several speakers during the action research sessions, taking notes and discussing "procedures" in the group and with my critical friend, I finally realized the key for me to answer my question was by "trial and error." I find trials not my favourite way to do things. I favour "tried, tested, and true," but obviously "tried, tested and true" weren't getting me where I wanted and needed to be. I experimented with a number of strategies including rubrics, math journals and shared reading. During the process, I observed, kept my journal, and collected samples of student work that demonstrated the impact of my efforts.

At the start of the action research, the term "rubric" and samples of rubrics kept surfacing at workshops. I was truly apprehensive when I first printed one on chart paper and used it with my class. The area was "writing." My class, like me, took a while to grasp, in detail, this "outline" of what is required in a story. But I continued to use the rubric with them in a variety of quick, very short writing tasks ranging from a guided, "specific topic" journal entry to a short paragraph. Later, I involved the students in rubric-based peer and self evaluation using Levels 1 to 4 of the Ontario Curriculum. I also encouraged them to use the more precise terminology, "I evaluated…," rather than, "I gave...."

Now I tried a new venture, math journals. At first, I avoided them because I was not clear on how to guide or encourage my students. When I tentatively tried, I saw some progress, but not what I gathered should be evident, after consulting the EQAO "sample answers book" from the May 1999 test. Finally, I swallowed my pride and sought help from a pleasant, knowledgeable

young lady on long-term placement at our school. “What did our special assignment teacher do?” I asked. “How do you use math journals? Could I see a completed sample...?”

The Kindergarten teacher needed a class to be reading buddies for her students. Last year to help my Grade 6’s remain on task as reading buddies, I had developed a reading page to be completed each time we shared our reading time. I also required, when we returned to our classroom just before recess, that my students read aloud the sentence they had scribed for their little partner. This way everyone had practise, not only formulating a complete and interesting sentence but also hearing other quality sentences using stronger verbs and interesting descriptions.

This year when I introduced the concept of subordinate clauses, many students initially encountered difficulties composing realistic complex sentences even after modelling and practise! I used the scribing as the solution, I simply made a subordinate clause a mandatory part of the sentence(s) they had to write for their Kindergarten reading buddies.

We also undertook a number of class studies including ones on archaeology and healthy eating. To fully complete their task sheets, students needed to organize their work and clearly answer all the questions, “who, what, when, where, why, and how.” When we studied a topic, we used a series of steps that included developing definitions, building an outline, finding subtopics in which students were interested, studying pictures, diagrams, and artifacts, doing individual and group research, working to a rubric, discussing, questioning, and evaluating and displaying final products.

Findings and Conclusions

I discovered that the best part of action research is having a critical friend at school who attends the same meetings and who is readily available for regular conferencing. My colleague's casual use of "specialized" terminology in the staff room has piqued the interest of other staff.

Having students use a rubric to develop one-sentence summaries of shared reading seemed to bring quick and noticeable results. We could all hear the improvements when students read aloud their beginning sentence, first paragraph, and, later, their story. It was then that the "my writing" guide page in their personal writing folder made sense to them and they began to work more independently.

As I continued tenaciously using this process of oral sharing, observing, and recording evaluations, I realized a most interesting and welcome discovery. When my students were involved in evaluating the work of their own classmates, not only did everyone quickly come to understand the task in greater detail, but the major portion of marking a task or project was done in class time! Initially, I required that they write the classmate's name, topic, or title, three stars (compliments) and a wish (one thing that could use improvement for the next presentation). I found the students to be very honest, generous, perceptive and accurate as well as empathetic.

I found it frustratingly time consuming at first to insist that students use, "I evaluated…" rather than "I gave…" during peer evaluation activities. The class was also impatient and frustrated with themselves when they forgot and reverted to the familiar, "I gave…" However, I noticed the persistent use of, "I evaluated…" gradually resulted in a whole new tone and comfort zone. Students seemed more confident. Amazingly, without undue prompting, the evaluators were suggesting improvements. They were assisting, reminding, and prompting each other more effectively!

At one point in the year, I finally realized that the task sheets I'd developed over the past couple of years were a type of incomplete rubric. Several parents indicated that they liked this tiny, colour-coded, task sheet because, "Everything is there." This year, the task page is accompanied by the marking rubric.

It took time to teach students the math journal format, "first, then, next, finally." I used lots of coloured chalk, peer sharing, and suggestions. Suddenly a comment from one student indicated a breakthrough, "The more I do these, the easier they are to do!" Others also began to realize that extra practice makes perfect...or at least makes progress. But, the most satisfying moment came the day the "first, next, then, finally" of the math journal transferred into writing a story.

Over time, I systematically removed the scaffolding provided by the generic writing rubric. At first we used the full, posted rubric to write short paragraphs and stories. The next step was to work backwards. I read a story and they filled in a chart answering who, what, when, where, why, and how. Later, I provided "the story skeleton" and they planned their own adventure. I happily noticed willingness to commence the task, enjoyment during the writing time, interest in creating a quality story, and keenness while they were working.

Recall and performance were enhanced amazingly through the process of writing sentences for the reading buddies. In the archaeology learning project and other projects, class results were high and students felt satisfaction and pride in their work. Students working at Levels 1 and 2 tried to improve, reach, and stretch and other teachers expressed interest in what I was doing.

This year, after my action research, EQAO-related workshops, and work by specially assigned teachers, I am certain I am heading in the right direction. I see my class this year so

relaxed and self-confident. They are certain that they really know what to do. My students may not have accomplished each test task in complete, precise detail but at least they were not frustrated and crying. No one put his/her pencil down and just quit. Some students this year finished the EQAO test a bit ahead of the time limit, not because they did not understand how to tackle the problem, but because they recalled the procedure and were more secure in what they should write and do.

There are still many areas on which I need to work, but, with persistence and by using the ideas and suggestions gleaned from this past year, I feel hopeful. I am curious to see where my action research will be a year from now. It would be interesting to see how much more journaling, self-reflection, and self-evaluation I'd try. I already have some ideas that I'd like to put into practise next year...and know pretty well how I'd approach them.

My own sense of comfort in approaching the annual EQAO testing is miles from where it was. Part of that confidence has come from our special assignment teacher, as well as my very special critical friend plus the quiet, seemingly-relaxed but constant support from the school.

Organizing Ideas in Writing, Grade 5/6

Joyce Johnson
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St. Joseph Catholic School
Grade 5/6

Research Question and Significance

My research question was, **"How can I improve the students' organization of ideas in their writing?"**

I analyzed the EQAO provincial test results in order to determine my concern for the students in my classroom. Once I identified the problem, I was directed to find a solution by implementing corrective action strategies in my classroom. EQAO results for my students clearly pointed to one particular area of concern: organization of ideas in their writing. Improving this was no easy task. After consulting with my school team member, I decided to focus on two areas, journal writing in mathematics, and creative writing in the French Language Arts program. We were advised to keep a reflective journal throughout the action research project. I soon discovered that my on-going reflective journal writing helped me to focus on my research question while I struggled to ensure that I was also teaching my grades four and five students all of the ministry expectations as outlined across the curriculum.

Methodology

I soon discovered that I had to examine the teaching and assessment strategies that I use to motivate and teach my students. I organized the students into small discussion groups. I directed them to read the math problem or question, then think about the solution, discuss the

solution, and finally write their solution. During this activity, students took turns discussing their solutions before writing them in their math journals. Most of my students find it difficult to explain their answer when solving math problems. In order to help them organize their ideas in written form, I suggested that they follow these steps – write down what happens first, what happens next, and finish by writing what finally happens: "First, Next, and Finally."

I decided to incorporate the strategy of incremental learning into my teaching. My focus on incremental learning or scaffolding led me to use the following teaching strategies to assist my students in organizing their ideas in their creative French-language arts writing activities. During the pre-writing stage, they were advised to organize their ideas by providing the answers to the following questions- Qui? Quand? Quoi? Ou? Pourquoi? Comment?

After reading a short story together, we completed a story web on chart paper. This story web served as a 'model', which they could refer to when creating their own story web. Most students found that the story web helped them organize their ideas in the pre-writing stage.

Last year, when I administered the provincial test to my Grade 6 students, I remember that some were overwhelmed by the writing task when they were faced with a blank sheet of paper. This year, in order to prepare my Grade 4/5 students for this task, I presented the students with three different story planners that would assist them in organizing their ideas in the pre-writing stage. I believe that these story maps or organizers can be used to promote incremental learning. My team partner is also using the same three story planners in the English Language Arts program writing activities.

The first story planner had many details that the students had to complete in the pre-writing stage. By completing these details, students organized their ideas relating to the setting, characters, and plot development of their stories. The second and third story planners got

progressively less detailed. After many writing activities, the students will have experienced a variety of organizational strategies. Eventually, they will, given the choice, choose the one they feel most confident and comfortable using when faced with a writing task.

Findings and Conclusions

I became much more aware of the different levels of achievement within my classroom. In order to implement corrective action strategies, I had to adjust my thinking about my long-term goals and objectives. I learned that I often fall into the trap, "teach, hurry, and test," rather than "re-teach, enrich, and remediate." Upon reflection, thanks to my reflective journal writing, I realized that I had to slow down and provide time for my students to reflect and collect their ideas and thoughts. I had to give them time to think, talk, and then to write. This strategy provided the opportunity for peer modeling**,** especially useful in math journal writing**.** My students found that this strategy helped to make the mathematical problems more manageable.

Some of my low-level achieving students were using task avoidance in the writing activities. They would look for a pencil, sharpen the pencil, search for an eraser, ask to go to the washroom etc. I had to devise a strategy that would help them move on, to progress from Level 1 to Level 2. Finally, just recently, I discovered these students enjoyed drawing. I asked them to illustrate their ideas, using three different pictures depicting the beginning, middle and end of their story. Then I asked them to describe each picture using words in complete sentences. They seemed less apprehensive about beginning the task. They were able to describe their pictures using simple ideas in an organized, mechanical manner, while discussing the beginning, middle and end of their story. They were happy with their work, and through teacher conferencing, were able to use some of the stages of the writing process to edit and revise each paragraph, one at a time.

To see if my students had progressed as a result of my work, we compared this piece of work to one they had completed earlier in the year and they themselves could see their own progress. Indeed, they progressed from one level to the next. I learned that students need evidence of their learning and of their progress in order to be successful. I realized that by using portfolios as feedback, I could emphasize improvement in their own previous best performance and discuss the next step with them, in order to improve their learning.

My students have the advantage of completing these story planners in both French and English-language arts activities. Studies have shown that students transfer language skills from one language to another. To ensure continuity of learning, I will share these organizational strategies with their teacher next fall. This teacher may choose to apply and review these teaching strategies.

After attending an assessment conference, I realized that I had to change my views on student assessment. I had to involve my students in their own assessment. I learned that I could achieve this by having the students discuss and interpret rubrics for the organization of ideas in writing. Together, we examined the descriptors for each level so that the students could understand how they could move from one level to the next.

By examining rubrics, students began to understand the criteria for each level. Also, students became involved in peer leveling of organization of ideas in writing by assessing each other's work using the descriptors for each level. Most of my students found this task to be a challenging one. I believe that they need more experiences in order to become more comfortable with this task.

I discovered that if I am to improve student organization of ideas in their writing, I must provide my students with formative, on-going assessment of their work. My students need

evidence of their learning and of their progress. This action research project pointed out a very important purpose of student portfolios. From now on, the students in my classes will be able to see their own progress as together we assess their organization of ideas in their writing from one assignment to the next.

Organizing Ideas in Writing, Grade 4/5

Elizabeth MacLeod
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St. Joseph Catholic School
Grade 4/5

Research Question and Significance

My action research question was, **"How can I improve students' organization of ideas in their writing?"**

Spring 1999 was the first year French immersion students in Grade 3 and Grade 6 in Nipissing-Parry Sound were involved in the EQAO Provincial Assessment. I had been teaching English-Language Arts to French immersion students for several years and enjoyed watching the growth of their English Language skills. I was always pleased with the fact that the students liked to write and share their stories. I felt that as long as they were writing their skills were improving. With their writing samples, I would look for areas of weakness and through group discussion and individual conferencing work on improving a particular skill. I was looking forward to the provincial assessment to see the strengths and weaknesses of the program. When the results of the provincial assessment were published, I was disappointed because the results were Level 2. I came to realize that I was not addressing correctly the expectations set out by the Ministry of Education. I knew that many of the students who wrote the assessment were capable of Level 3 and Level 4 work. The weakest area was the organization of their ideas in writing.

Methodology

I teach in a French immersion school and work very closely with the Grade 4/5 teacher as I teach her students English Language Arts for one hour a day. We decided to work on similar questions. Because I only teach English Language Arts, I concentrated on the organization of ideas in English writing.

I decided to define exactly what was included in the organization of ideas. I used the Ontario Curriculum expectations set out for Grades 4 and 5. I also studied the Ministry's writing exemplars booklet including the teachers' comments at the end of each writing sample. From these resources, I determined that the organization of ideas in writing included the following:

1. overall structure of a story with a beginning, middle, and end in a well developed, logical order
2. using opening and closing sentences
3. using sentences that are clearly organized in paragraphs that further develop the story line
4. using connecting words to link paragraphs.

Next, I examined my current teaching strategies as they related to the teaching of writing. The students needed to be exposed to models of good writing to see how they were organized. I would read a story to the students. Then, as we engaged in a follow-up discussion, we would fill in a story organizer so that the students could see the organization of the story. I used individual books, anthologies of stories, and stories from the writing exemplars.

Following this strategy, I felt the students were ready to try writing their own stories using some of the scaffolding- that is the story organizers- to which I had introduced them in the first activity. In this way, I was linking the previous learning to new learning. The organizers were used in the first stage of their writing process. The first organizer I used was the detailed

one I had used in the previous modeling activity - problem, goal, events, and resolution. Each new organizer I introduced was less detailed until the students could make their own organizers. I was removing the scaffolding for them with the introduction of each new story organizer.

Another strategy I used asked students to write a number of "on demand stories" in their journals over a period of three or four weeks. Then I had them choose their favorite pieces of writing. At this point, I introduced the students to the concept of a rubric. We discussed the descriptors for each Level of work (1, 2, 3, and 4) as they related to the organization of ideas in writing. Together we completed a rubric in language that was familiar to them based on the criteria described in the first rubric that I had introduced. Then, students had an opportunity to evaluate their own work based on the rubric that we had developed together. They wrote explanations of their choices and what they would do to improve their work to the next level. The students then revised their work, improving areas based on the rubric.

The final step was peer evaluation. Each student evaluated another's work, assigning a level and a comment based on the rubric.

Findings and Conclusions

I found that my students were very interested in the stories I read them and in determining how they were organized. As I moved from more detailed organizers to less detailed organizers, a number of students became more independent in their work.

As the students were writing their stories based on the organizers I taught them, students working at Levels 3 and 4 adjusted well. Students working at Levels 1 and 2, however, had considerably more difficulty. Their writing was not moving in an organized way. They wanted to write unhampered by any restrictions or particular guidelines. After a discussion with my critical friend, therefore, I followed the plan she was implementing in French writing. I had these

students illustrate their ideas as “beginning,” “middle,” and “end” and then write a few sentences about each. Through this method, the students started to see the organization of a story. Together we added connecting words and then expanded the ideas. The results were much more positive. They felt much better about what they were doing and so did I.

As I read through the students’ evaluations of their work, I found interesting comments like the following ones that showed students were able to use the language of the rubric:

- “I gave my story a Level 4 because I had complex ideas, a definite beginning, middle, and end, connecting ideas and my paragraphs were linked to the story.”
- “I gave myself a Level 3 because I have paragraphs and connecting words.”
- “I thought it was a Level 2 because there was a sense of paragraphs, a sense of a beginning, middle, end and some connecting words.”

During the peer evaluation phase, I found the students became far more independent as they corrected their own work. They were not coming up to me all the time to mark their work. They would look at the rubric or talk to their peers. Peer assessment comments made by students in this portion of the exercise included:

- "I found your story very interesting but it should have more paragraphs."
- "Your work was good. It had paragraphs, connecting words, and a beginning, middle, and end. Good work!"

Prior to this year, I was not always successful in peer editing. However, this was a positive activity. With the rubric, the students had specific criteria to talk about. Here are some of their comments about the experience:

- "The rubric was helpful to me because now I know what a Level 1 and 2 is and so on. If I got a Level 2 and I wanted a Level 3, I would look at the rubric and see what I could do

to improve. This experience has made me a better writer."(student operating at Level 3)

- "It was fun grading our work to find out what our level was. I liked using the rubric because we found different ways to improve our work to make it a higher level." (student operating at Level 4)
- "I thought it was good because we got our level. After we got our level we knew what we needed to do to improve our next story." (student operating at Level 2)

In conclusion, my involvement in the action research project gave me an opportunity to examine many of my teaching strategies and I have made changes. I realize now that my teaching often involved, "teach, test, hope for the best" with a minimum of feedback and very few next steps. A major change has been having my students become more involved in their own learning and in the assessment. The students need to know what is expected of them in order to improve their work and move to the next level. The rubric is an excellent tool to accomplish this. Together, teacher and students can establish the criteria for each level of learning so that the students will know exactly what is expected of them. The key for me now is to look for progress, rather than just performance.

Using Modeling in Math Journals

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St. Alexander Catholic School
Grade 4

Research Question and Significance

My research question was, **"How could I use modeling in math journals to help students explain answers more fully to obtain a higher level of achievement?"**

The scores for the Grade 3 students in my school on the 1999 EQAO provincial tests were not very impressive. After reviewing the test results with several parents, we concluded that the children were focusing on one method of answering math questions and not exploring other options. The children had been exposed to the new math material from Quest 2000 for most of the previous year but were still not able to explain their ideas fully on paper.

Methodology

I began the year 2000 with math journals, -a new year, a new book. I did not have any idea what they should look like or should contain. I decided that the students would be able to write out point form and formal assessment answers, which I scored on the rubrics from Quest 2000. I realized that, if I modeled an answer, the children could use the ideas, add their own experiences, and come up with a reasonable explanation for a question. We started our adventure with a summary of triangles and quadrilaterals which we had studied. I put diagrams on the

board and the children provided the required information. Maybe we are on the right track discussing orally, recording data, and then writing things down.

After a class discussion, I decided that only Levels of Achievement 1-4 would be used in the journals. Level 4 was read over several times because this is what I wanted the students to be able to accomplish. The qualifiers few, some, most, and all were used to design the rubric Now it was time to begin a new unit as all of the ground work had been laid out for journal writing. We worked on a unit in Data Management. I thought graphs would be easy. Students were expected to analyze what they were doing. We started the unit with basic information (different types of graphs, different types of questions). Then, we started to build the scaffold together to get through the unit and to help the students understand.

A graphing assignment was given out part way through the unit as an assessment. I wanted to see if the students were grasping the material without my help. I used the data, drew my own graph, and wrote out the mean, median, mode, and the range. At least I knew how to answer the question. I then gave the question to the students. They knew how to sketch the graph and answer the questions. When I scored the assignment, most of the students were at Level 2 or 3. One child became a focus because he could not get the information put onto the graph even though we had spent several days drawing different graphs. He was not happy with his mark level.

Then I went to a special assignment teacher with my problem. She suggested that I put my model answer on the board for the whole class to see. So that is exactly what we did. I drew the graph on chart paper with the help of the children and then we proceeded to analyze the graph together. It was a very successful class. The students felt extremely proud of themselves. For the next step in the process, I wanted to see if they really could analyze their own material. I

presented the next question to them. “These are the results of spelling scores for a Grade 4/5 class based on sixty words. Graph the data and analyze the information."

The next unit was Number Sense and Numeration with a focus on multiplication. Students were going to have to do the extra practice at home. I gave the students two weeks notice and asked that they study certain facts at night. This was recorded in their daily agendas. We started with Mad Minutes -- one minute to answer fifty questions. But how was I going to record the data so it would help the students? The math journals became a place to record marks. We took ten minutes to construct a graph in our journals. Every day for one minute we checked our skills. At the beginning of each math class we did our multiplication drills. I then handed out the previous day’s test and they recorded their marks on their own graphs. By the third day, students could see their progress. They also had sheets to take home to review with their parents. Some children challenged their parents to answer as many questions as possible. My focus student predicted that by the end of the ten days he would score a 50/50. His parent was in the school and immediately became involved in what he was doing. A sum of ten dollars was set to challenge the student to work toward improving his knowledge of facts.

Findings and Conclusions

During the initial lesson, the students realized that if they could sketch out the picture first they could write down the information about isosceles, scalene, and equilateral triangles almost as fast as I could get the information on the board. The principal was outside at recess and the children bragged that they had started a new adventure with math journals. They were able to explain the different types of triangles and explain right angles to the principal who later told me the story.

I was very impressed when most of the students completed graphing the spelling scores and scored Level 3 or 4. They were using the correct terms for their explanations. My one student, who was not able to complete the work previously, was not only able to graph the data on a labeled graph but he was also able to determine the mean, median, mode, and range correctly - a big change for someone who two days earlier could not draw the graph. He needed to have the model outlined and discussed before he was able to complete the work. His baseline score recorded in his math journal was 12. By day seven he managed a 45. On days eight, nine, and ten he scored a perfect mark and realized he was going to have a straight line on his graph. Excellent, I thought because it set a goal for others in the class. His mother came in complaining jokingly about how expensive this math assignment was. His mother paid the $10.00 happily and I was very happy with the results. He responded that he should have started studying earlier because he would have made more money. Most of the class saw progress and were delighted to show their graphs to their peers.

The math journals showed that giving a question and expecting the students to answer at a Level 3 or 4 was going to take some work. The students were given enough time to begin the work in their small groups, then meet as a whole group to discuss what they had done. The feedback to the students was crucial to the learning process. We built small steps into the daily work so the scaffolding was being put together as a group. Once they had mastered the steps, moving up the ladder, we could begin the assessment. Using rubrics from Quest 2000 became part of the marking process, and also the learning process too. Group work, class work, and daily work can all be excellent ways of expressing understanding. Math journals are another way of teaching children to explain math concepts. They also allow the teacher to evaluate, give

feedback to the students, and provide opportunities to examine what their peers have accomplished.

I set up units of study according to the Quest 2000 program, taught the necessary skills, and used journals to assess their responses. I wanted the students to feel comfortable with the new process so evaluation was informal. We included definitions in the journal as a unit review (triangles and quadrilaterals). Pictures and written work were required and used in samples given to the students. It became a great way to help the students to study their terms. It also kept definitions, diagrams, and explanations all together.

As a result of this study I believe it is important to let the students:

- see what is required by using and developing rubrics for achievement which build on the previous unit.
- learn individually, in a small group, or as part of the whole class (which is very difficult in a combined grade). Build small steps into their daily work so they can be successful.
- experience different ways to answer questions and explain their answers. There is more than one way to get an answer.
- check their work, give suggestions on other ways to answer math questions, and use a journal
- keep an on-going record of their work and mark it according to achievement levels. Provide the students with ways of reaching another level. (It might be the making of a graph.)
- have opportunities to try the questions again. This could be done in the same unit or as a warm up or follow up activity in another unit. They do need to feel successful.

I will also continue to use math journals because it helps to keep me organized and if it helps me understand the new math it will certainly help my students. I don't think you have to use math journals regularly. I kept it as a special activity and found very quickly that the journal

results meant more than the test results. In order to make them aware of expectations, I even had the students give themselves a score after an activity was over. Some students could evaluate themselves with scores similar to mine. Hopefully this is an area for me to work on in the future.

Using Modeling to Improve Written Communication Skills

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St. Alexander Catholic School
Grade 3/4

Research Question and Significance

My research question was, **"How can I use modeling to improve written communication skills in reading, writing, and mathematics?**"

After administering the EQAO tests in the spring of 1999, our school felt confident that the students had done a good job. Imagine the surprise and disappointment when the results arrived in the fall indicating quite the contrary. This perplexed me. Despite just arriving at the school in September 1999, I knew the teachers involved personally and professionally. Why was there a gap between expected and actual results? What went wrong? These were excellent teachers with good knowledge of the expectations and experience with the process. These were good students. Why the poor test results?

As a result of these concerns, we began to "assess the assessment." Ruth Sutton (1997) states in The Learning School, that to make assessment efficient and useful, we must use the results to improve our teaching. The cycle Sutton proposes to improve teaching is: identify intentions for teaching; identify teaching expectations; record results, analyze results. The crucial stage, according to Sutton, is the analysis, the results of which feed forward to inform the next intentions for teaching and learning. Personally, I felt I was fairly good at completing the

first three parts of the cycle. I fell down when it came to analyzing the results of assessment and using them to start the cycle anew.

Methodology

After analyzing Grade 3 assessment scores, I felt I needed to make some simple adjustments in the strategies I used to teach that might enable my Grade 3/4 students to perform better. I felt that the students had the appropriate knowledge but were unable to express themselves adequately. I wanted to arm the students with the tools needed to convey the knowledge they already had and would later be taught. I started by presenting the children with a rubric for written responses. The rubric was based on the four Levels of Achievement in the Ontario Curriculum. At first students were overwhelmed by all of the information, so I decided to break the rubric down into its component parts and deal with each one individually. We started with Reasoning and discussed each of the elements of reasoning in detail, demonstrating simple examples of what types of answers would constitute work at Levels 1, 2, 3, and 4. We carried on with this process over the span of two days until everyone was comfortable with the information.

In the next step, I provided models of expected performance at each of the levels described in the rubric. We read a story together called The Winter Birthday. Afterwards, the children were required to respond to a series of questions based on the reading. I asked one child to respond to the question, "What is Momma Bear doing?" and I scribed the student's answer on the blackboard, demonstrating for the whole class. Through discussion based on the rubric, the students decided that the response given was at Level 1. I encouraged the students to modify the answer, in order to improve it. I tried not to interfere or prompt with leading questions.

I continued to use modeling in my teaching whenever I found an opportunity. I found it could be very time consuming which was a deterrent at times. However, it did enable me to build scaffolding with the students.

Ruth Sutton first introduced scaffolding to me. Ruth told us that scaffolding in education is very similar to scaffolding in construction. It is like putting scaffolding up around a building as it's being built. As each new area is built, part of the scaffolding comes down so that eventually all of the scaffolding is removed and a strong structure is left standing.

An example of scaffolding that I used with the students follows:

When picking out key points in a story:

- First Attempt – The teacher models strategies students can use to determine essential information
- Second Attempt – The teacher and students decide together what information is essential
- Third Attempt – The students decide independently what information is essential.

I used scaffolding to teach students story planning. The work on scaffolding let me begin developing my own rubrics and introducing them to the children before a unit was taught. I developed a number of rubrics including one for a Medieval Times unit.

Findings and Conclusions

The initial introduction of the evaluation rubric provided groundwork that was critical to the future successes of the students. After completing the reading rubric, the students had a clear understanding of the framework for building their answers. They could also accurately predict the level of a piece of writing before they handed it in.

The first attempt at using the rubric to improve an answer produced results that were very encouraging. I was delighted when the result was a far stronger answer at a higher level of

achievement. In fact, the students were able to point out some solutions to problems I hadn't recognized myself! What happened next was even more interesting. I asked the children to answer independently the second question, "Why is mama bear digging in the rocky earth?" No one gave me a one-line response. I received excellent responses, many of which included inferences (more than just what was written in the story).

Another interesting discovery was that the students could act as models. I didn't realize that before and neither did the students. During math lessons, I started to encourage more group work. I would give each group a math question, let them work it out as a group, and then report to the class. Students learned different ways of coming up with the same solution. The interest level was high and the experience was meaningful for students. So modeling began to take on new definitions and shape. Not only did it become important to me as an educator, but to me as a learner as well.

I didn't realize how closely intertwined scaffolding was with modeling and with the development of class rubrics until I jumped into my action research headfirst. The more I thought about it the more I realized that scaffolding was critical to long term memory retention for the students. I found I could also develop scaffolding to support my own professional growth and to increase my confidence as an educator.

Scaffolding is similar to breaking down processes into smaller attainable pieces and adding new elements as the students are ready. Based on the data I have collected, I am confident that scaffolding is an effective teaching method, especially with respect to story planning. Coming from an early primary background, I had very little experience in planning stories with children. However, the introduction of story planners gave the students and myself much needed direction. I introduced several different types of planners over a two-month period

and continued to refer to the writing rubric frequently. This scaffolding of information led to a high comfort zone and some of the kids started to use planners of their own creation.

The use of planners allowed students to use all elements of a story. The rubric encouraged the students to polish and edit and put forth their best efforts. There is nothing more invigorating than watching children choose to look up a word in a dictionary or try to find a better word in a thesaurus.

Another example of how rubrics improved student ability to achieve occurred during the Medieval times unit. I assigned a castle project but also distributed assessment criteria and a rubric. Due to the clear expectations for the project, the modeling and rubric development, all of the castles were extremely well thought out and made. Resources used were varied, but all looked as though they required a great deal of effort to complete. What impressed me the most, however, were the oral presentations. Almost all of the children were able to identify at least 10 features of a castle. They were able to describe each feature and define its function. Finally, the rubric helped me to easily evaluate each project by circling the appropriate level for each expectation. Most results were at Levels 3 and 4. Then all I had to do was to transfer the information to the report card.

At the beginning of my reflective teaching journey, I perceived my goal as creating a climate where the learners could demonstrate effective results in their daily writing and ultimately on the Grade 3 EQAO assessment. The surprise that has captured my heart was the change it made in me. For me, learning about corrective action has been an awakening of responsible teaching. The results will continue to grow as I encounter new students each year. I am thankful for this awakening. Analyzing poor EQAO test scores has enabled me to use the test results to develop new intentions for teaching. The idea of taking a serious look at test results

and using the conclusions to develop intentions for teaching has become engrained in my methods of preparation and assessment.

Action Research Reports of Centrally Assigned Teachers

Effective Practices for Curriculum Introduction and Teaching Support

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Coordinator

Research Question and Significance

My research question was, **"What effective practices can I implement as a coordinator to introduce new curriculum and to support effective teaching practices?"**

On the whole, the 1999 EQAO test results from our board reflected considerable scope for growth across the system. My role as coordinator was made clear when it became apparent that the new curriculum needed additional support specifically with Quest 2000. (also test taking skills)

Mending the climate of change in any educational system is an enormous task. The role of Coordinator is to build strong scaffolds between provincial expectations, board budgets, principals' implementation styles, teaching practice, and of course student productivity. With the rapid change the educational system is experiencing, the management of change must be carefully implemented. I struggle with my role as a change agent. There is no manual to follow.

As a classroom teacher, I was privileged to be able to pilot the Quest 2000 program in my Grade 5/6 classroom. The complexity and higher level thinking skills required of both the

teachers and the students reinforced my beliefs that the integration of all skills taught is necessary to produce true understanding. It was with this basic concept that I embarked on my job as Coordinator -- to sell the Quest 2000 program to our teachers. The reality was that schools had indeed purchased the much-praised program through government funding. And yes indeed, this program did match the EQAO style of testing and was the recommended program to purchase. The complexity of the program is only understood through the teaching manual and I found teachers struggling in their classrooms with only pieces of the puzzle because the program had been purchased without teaching manuals. The first taste of Quest 2000 was bitter! I still had faith in the program and it was my role to provide support to colleagues, correct the inappropriate introduction of the program, and foster the continued use of Quest 2000. This task is, needless to say, enormous since it is difficult to recover from the bitter first taste.

My corrective action course was indeed difficult but one that I had faith in. I realized my journey would be over several years and would require a range of leadership strategies and supportive colleagues to fully implement.

Methodology

My first job was to insure that each teacher had manuals. This involved communication with teachers, principals, and superintendents and taught me several valuable lessons; don't make assumptions; inquire as to whether teachers have the proper materials and; the classroom is still the most important context to collect data on student and teacher needs, behaviours, and attitudes.

Being visible in the classroom helped me see the real climate of the Quest 2000 implementation. The teachers' voice of concern was and continues to be the driving force between good practice and corrective measures. I soon realized I had a strong group of core

teachers that had a good working handle on the program. We needed to pull together to make the program work. I needed to record their concerns and act on their challenges. Large and small group workshops were designed by teachers to promote the successful implementation of Quest 2000.

Individual contact with teachers continues to be one of the most successful strategies in creating effective practice. Planning, material collecting, and peer teaching were used to promote the program. It is very intimidating for teachers to admit publicly that they are struggling. One to one peer approaches create a safe environment in which teachers can share honestly and take ownership for change. Personal ownership is what I strive for in the change process. The ownership for change was reinforced after a phone call from a seasoned teacher. She was reluctant to try math journals, but did so after a team planning session. She was astonished with her success and immediately phoned to share her new learning. She is now a firm believer in the journal approach to teaching and communication in math. Her practice, attitude, and level of comfort with Quest 2000 changed as a result of group in-service that allowed her to take ownership of the new program.

Special assignment teachers, experienced in EQAO marking, were hired to provide weekly peer teaching in Grade 3 classrooms. Their role was to implement effective use of math journals and to provide assistance with reading, writing, and general test taking skills. These special assignment teachers encountered a variety of hurdles as they climbed the learning curve of team leaders providing assistance with change. The positive outcome was that frequent contact, team planning, and team teaching were now the guideposts that directed our teachers towards more effective practices.

In December 1999, I was privileged to be part of the EQAO anchor selection and field test team for Grade 6 writing. This marking set the framework for the next phase of preparation for the Grade 3 and 6 testing. The experience created a deep understanding of how the test was established, implemented and evaluated. The levelling of student writing samples provided a thorough understanding of effective, current assessment and how assessment can shape effective teaching. I wanted to repeat these experiences for our teachers. Grade 3 and 6 teachers participated in two small group workshops. The first workshop reviewed curriculum expectations and teaching practices and included a variety of levelling activities using the Writing Exemplar document. Teachers were eager to share their anxieties with other colleagues who had similar concerns. This improved morale and allowed teachers to gather information that would alter their teaching practice and, hopefully, improve student writing. At the end of the workshop, teachers were willing, with EQAO's permission, to administer the process writing piece and the demand writing piece from the 1999 test.

The teachers returned to the second workshop ready to work. This workshop introduced the Reading Exemplar booklet, a welcome partner to the already familiar Writing Exemplar book. The teachers discussed the struggles and various approaches they took in administering the assignments. The remaining section of the workshop was devoted to the evaluation of writing samples from the teachers' classrooms. Teachers were placed in marking teams and used the EQAO marking rubric to evaluate the samples. This did not remain a quiet activity for long.

Findings and Conclusions

In the period between workshops all groups reported an increased number of teachers contacting each other. The contact was a sign of the natural networks that need to be in place for educators. I feel the bonds of trust and sharing similar experiences are key to building a network

of strength in our teaching climate. Administering last year's test provided good learning opportunities for both our teachers and our students. Teachers commented on how difficult it was not to interfere with the students' writing. It is part of the nature of teaching to want to assist, provide direction, and to nurture young writers as they write. Teachers also commented on the time restrictions placed on students. In process writing samples, students needed more time for planning, writing, and revising. When completing demand writing samples, the teachers also commented on time. The idea of budgeting time for planning, writing, and editing needed to be addressed. The mock sessions helped teachers formulate their intent for teaching. They learned not to deficit mark and to mark against a rubric not against another student.

The teachers marking experience was very well received. It was even difficult to clear our conference area at the end of the workshops. The teachers wanted to discuss, mark and learn. I was pleased with the success of the two consecutive writing workshops. Conducting evaluation workshops where colleagues learn to mark together is a long overdue corrective action for our teaching profession. I have often devoted my time as coordinator to implementing new curriculum through workshops. I realize now that I have neglected the evaluation stage as an essential component to shape teachers' actions.

Evaluation was the key element that made our northern teachers feel out of the loop throughout this educational reform. We are teaching programs similar to the southern boards yet not experiencing the same results on the provincial tests. This was a puzzle. There was lots of room for improvement. Sharing the "good experience" of EQAO marking with my colleagues, created a climate of trust among my peers. We now feel better equipped to encounter the spring EQAO assessment. We know exactly what is expected and how we will be evaluated. This

establishes a "fixed target" to which we may set our compasses as we formulate our intentions for teaching.

As Coordinator, I feel the evaluation workshops created an even start for all educators and provided a good baseline for corrective action for both my colleagues and myself. I feel that the increased number of requests to repeat these workshops is a good indication of their positive impact. My blueprint for in-service will be:

- increase the number of small group workshops
- plan workshops that are consecutive in nature (two or three at least)
- share similar tasks
- provide clear expectations to plan towards
- provide time for talk (creating a climate of trust).

I had two experiences this educational year that have greatly shaped my thinking. The first was the EQAO marking experience in December and the second was attending the workshop with Ruth Sutton this past winter in Toronto. It has become apparent that evaluation was a much overlooked element in teacher training. We have spent so much time designing, purchasing, and implementing new programs that the critical component in education - evaluation- has been somewhat left to survive on it's own. It is clear that teachers need to share this experience, have clear evaluation targets, and use common rubrics. After reading Ruth Sutton's book The Learning School, I was able to go back and provide evaluation for my own practice as a Coordinator. Using her model, the "Cycle of Teaching Assessment and Development" shaped my actions as a Coordinator as I attempt to provide good models for teachers' practice.

Achieving the Trust of Teachers

Cilla Dale
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Special Assignment Teacher, Grade 3,6

Research Question and Significance

My research question was, **"How do I achieve a relationship of trust with teachers as I work with them in their classrooms to improve student learning?"**

My role as special assignment teacher for six months has been that of co-teacher. The job has been adapted on an ongoing basis to suit the needs of a group of teachers and students in the process of changing some of the ways they teach and learn. My concern has been to establish a productive working relationship with the teachers, always keeping in mind our common goal of improving the quality of student learning.

The original impetus of unsatisfactory provincial assessment results, was not a sufficient justification, in the minds of teachers, for adding another teacher body into the classroom or for making wholesale changes in teaching practice. A different kind of justification has to be established, one that made sense of the looming presence of the test. The EQAO results did, however, provide us with an opportunity to analyze data and identify general areas of weakness. Since that analysis had already been done on a board-wide basis, I felt my first task was to make teachers aware of it. Then we needed to identify connections between particular curriculum expectations (skills in language and mathematics had been identified), teaching strategies, and desirable practices. We could, for the moment, set aside the issue of the test. The hoped-for

improvement in test results, in my view, would happen eventually if, as a result of our combined efforts in the classroom, we could somehow create ongoing improvement in student achievement of curriculum expectations.

Methodology

I started the assignment in December, bringing the following:

- an example of a reading response task, with a rubric for Levels of Achievement in reasoning and communication
- organizers for a math journal to help frame responses using words, pictures, and numbers
- a paragraph writing task to be done using writing process steps.

These items were tools for modelling language and math communication and were also a way to broach the subject of the rubrics and Levels of Achievement. Most teachers were just hearing about these and were receptive to finding out more. I also hoped to elicit from teachers what they felt their needs were to bring about improvement in student performance.

The focus areas for my own involvement were identified as math journal writing, specific strands in math, process writing, and response to a wider variety of reading material. Sample actions in January were:

- modelling the scaffolding of a poem before students read it and answered questions
- having students work at the board in front of the whole group to illustrate how they solved a math problem (comparing strategies)
- helping an individual student recognize the level descriptor that matched his piece of writing and identify his own next steps.

One of the necessary approaches was that of the Quest 2000 math program, with its emphasis on giving students extensive hands-on experience in activities before asking them to

reflect on and communicate their personal learning and strategies. It helped that I believed in the approach and had some experience with it. Now I needed to establish some credibility with my fellow teachers, who might think I had all the answers, might think I had none, might object to my presence, welcome it, or merely tolerate it. The initial responses I received from teachers ranged from mildly dismissive to warmly welcoming. So, right from the start I had to judge how far I could go in suggesting an activity, a strategy, a resource, or a degree of collaboration.

My early notes contain examples of attitudes I encountered, strategies I thought were ready to be tried, students I noticed, a presence or absence of materials. The notes were my way of trying to assess what I might encourage next, so they became a record of different degrees of readiness. For example a teacher in December expressed resistance to using the new Math program when the previous one was familiar and served well in the past. The same teacher, in late February, was eagerly explaining the virtues of a particular component of the new program to fellow teachers at a staff meeting. The initial action on my part to such roadblocks was to ask what the teacher found to be the biggest hindrance and then to create and provide one resource she identified at the time as being possibly helpful. By the next visit, the teacher had taken some initiative and was ready to give the program a try. During the following months we worked on problems with split grades, problem solving steps, math terminology, use of multiple representations and strategies, pictures, words, numbers, concrete objects, giving students graphic organizers and so on.

The data I collected and used to determine how best to foster trust throughout the six months of my assignment included the following:

- feedback sheets from teachers handed out in January with the heading, “How am I doing?”

- on-going entries in journal/daybook relating to teacher level of comfort, observations on student motivation, changes in teaching/learning/assessment strategies, teachers' opinions on student progress, and next steps
- samples of student work as evidence of results and of confidence building in our collaboration
- feedback sheets from workshops given to teachers in March and April
- notes taken during conferencing sessions with teachers that helped me identify patterns of need (which would prompt reflective comments in my journal, target-setting for the next session, and the searching for or development of resources).

Findings and Conclusions

There is no doubt that my own practice has been affected by the experience of the last six months. The experience has given me the chance to re-affirm my own convictions and also learn from other teachers, because I have had an unusually rich opportunity to reflect on teaching practice. I also knew I had to "walk the talk" by modelling in practice the approaches which were judged in theory to be appropriate, and even essential, if certain focus areas were to come to life in the classroom. Even the best welcome does not totally diminish the personal risk-taking involved in the kind of improvisational "thinking on your feet," "problem-solving-as-we-go" approach that took place in the classrooms, either side-by-side with the teacher or with the teacher as on-looker. I found the process ranged from nerve-wracking (in a perversely satisfying way) to outright exhilarating. It is easy to look back and relish the successful results now that good relationships exist, but moving forward often required an almost chameleon-like response to the variety of environments in which I found myself.

It seems to me that sensitivity, at the outset and following up on requests was a determining factor in developing a relationship of trust. In every case, when a teacher identified a need, we talked about what I could do to help. Letting the teacher's voice be heard, especially early in the process, was very important in building relationships. My notes show that as time went on, teachers took increasing initiative to customize and create tools such as rubrics and made more specific requests of me, because they had a clearer sense of direction and purpose. By April, there were requests for support in setting up exploration centres for certain math units that would accommodate split grades and exceptional students. Other teachers who were not part of "my" group were also now involved in seeking advice and support, partly I think, as a result of divisional meetings (facilitated by release time) that had allowed more systematic sharing of experiences with the new math program and process writing. This had given everyone a chance to see together the relatively small increments in skill level found in the grade to grade progression of the curriculum expectations. Teachers had a better sense of not being alone.

I knew that my own pre-existing notions of "good " practice would influence the direction in which I might attempt to lead teachers. So I acknowledge an "agenda" underlying my actions, but I also know I am constantly processing signals from those I work with in order to have a sense of where they are. I believe my bias coincides with these notions (specific to my task):

- that students should be involved in much hands-on exploration in math activities (predicting, experiencing) before drawing conclusions and communicating their own learning or strategies
- that in the process of writing, students should learn to take control of revising and editing their work

- that students will only learn to understand and appreciate a variety of text if they are given guided opportunities (this is where scaffolding comes in) to read and respond to a variety of text.

I noted that the teacher's job was made more difficult by the fact that teachers were still very much in process of becoming familiar with the curriculum (especially how the teacher's own grade expectations fit into the continuum of expectations). The new math program seemed overwhelming and students did not have all the skills needed to work independently at reading and writing tasks. My own interactions with students supported the notion that many students lacked self-direction in language activities and were probably not reaching their potential in attaining expectations. We agreed that two heads were better than one, so it seemed that we should be able to help create change and improvement together. In the January feedback sheets teachers said, "It has been great just to be able to bounce ideas off you and get some input as to what type of activities we should be doing in the classroom," and "It is reassuring having your support and affirmation."

I felt the potential hindrances to establishing a bond with teachers included: annoyance at the looming provincial test; reluctance to have a stranger in the classroom; reluctance to changing practice; and the perception that I was there to judge, oversee, or spy on teachers.

I believe the following actions eased the process of developing a productive working relationship:

- conferencing time to listen to teachers' concerns
- modelling risk-taking and specific activities and strategies that teachers requested
- creating and providing useful resources, and facilitating workshops in response to specific needs

- collaborating to devise criteria and rubrics for a task, and levelling work samples based on descriptors
- asking for feedback and taking action on the feedback
- setting up specific activities so there was no extra work for the teacher
- collecting and passing on tips, and teacher developed material across a group of schools (cross-pollination)
- working with small groups of designated students on a specific task.

The trading of tips and resources had the effect of binding us together in much the same way that countries that trade together are united. As test time grew closer, one teacher initiated a sharing of math strand "summaries", each one prepared by a teacher from each of five French Immersion schools, to act, for example, as organizers for revision of key terms. It is a good example of teachers taking charge and taking proper advantage of the liaison I could provide by distributing copies.

I pushed forward intuitively but made it a practice to write daily notes to keep track of the stages of each relationship. Those notes show that I depended less and less on planning ahead as the relationships became well established. They also show increasingly detailed information on what was happening in the classroom and the flow of proposed next steps. In the early days, I brought the same resources to everyone. Later, I differentiated in response to particular needs. More recently, teachers showed me and other teachers, as well, resources they, themselves, had created. I see that stage of development as a testament to the bond that has been established through shared commitment. If I were to continue in this assignment, I would follow the same guidelines, allowing for adjustments to individual situations. However, I would request feedback from teachers in a more organized fashion, at regular intervals, with specific questions that arise

from my observations and reflections, in order to have clearer targets and also more documented evidence of progress.

Helping Teachers Improve Student Learning

Rosemary Conlon
Nipissing-Parry Sound Catholic District School Board
Special Assignment Teacher, Grade 3

Research Question and Significance

My research question was, **"How can I increase my ability to help teachers improve student learning, in regard to reading, writing, and math?"**

My partner and I were presented with the discouraging results of last year's EQAO Grade 3 and Grade 6 assessment. Our mandate as special assignment teachers was to help in some way to improve student learning. We were to work with Grade 3 teachers in planning and implementing lessons. We set up schedules to meet with teachers and formulated lessons in reading, writing, and math. We were prepared to "get the ball rolling."

Methodology

Phase 1-getting everyone's feet wet.

The first day at school, I was welcomed by the principal and resource teacher. We discussed plans and areas of focus. Then I met the Grade 3 teachers. We had spoken over the phone so this was a quick review of our conversation. We went over some of the objectives for this year using the Grade 3 testing results as our baseline. We looked over areas for improvement and then the teachers gave me a brief history of their students' backgrounds. I established a place to work and meet the teachers every Monday before entering the classroom. The first lesson was based on modelling a paragraph using the "hamburger" analogy. The teacher followed up the

activity during the week. The skill of paragraph writing was integrated with reading. At the end of the day, I really felt there was an active commitment to improvement among all the staff at this school.

By the end of the month, the students were able to, in some way, identify fiction and non-fiction materials, know the difference between verses and paragraphs, and make inferences using part of the question in their answer. The students were also being exposed to a variety of literature.

Math was a great concern for teachers, particularly managing Quest 2000. Teachers were overwhelmed with the books that came with this program and were not totally convinced it taught the 'basics' or one strand of math effectively. They thought it jumped around from one area to another and that the students did not have time to internalize the material. Most of the books were on the shelf still in the plastic covering- a sign teachers were voicing their concern by refusing to use it. Principals requested that I pass along my ideas on how I approached math journals. The approach was to model a challenging question using manipulatives, numbers, pictures, and words to explain the thinking. This was new to both teachers and students but it was great that teachers were willing to try this approach. By the end of the year, teachers were using this strategy at least once a week.

During this phase, we also worked on the writing process. There needed to be a uniform method of using the writing process from K to Grade 3 and beyond. The process was modelled starting with a plan/web and a set of criteria was given on a variety of writing. Students practiced first drafts, peer editing, revisions, teacher conferencing, and more revisions, finally publishing a finished copy. Not all copies needed to end up at this stage. Some teachers had never seen the writing exemplars books. These would be vital tools in the assessment of student work.

Phase 2- swimming the distance.

We reviewed our focus. The superintendent wanted to see the teachers use a common thread from expectation to assessment. This would lead to report cards. We felt it was time to reintroduce the rubric. This was not a new concept to most teachers. However, the rubric had been presented as 'another' marking tool for teachers who were overwhelmed by the changes in the system. The rubric was introduced this time as a feedback loop so students and parents could plan for improvement.

Most teachers thought they did not have the time to compose rubrics; however, once they saw rubrics being modeled and the little time it took to write them with the students….they were hooked. By the end of the year, the students were using the vocabulary of the rubrics. It gave them a clear idea of what the teacher expected of them. The students realized it was their responsibility to meet the criteria laid out for them. They were being accountable for their work and teachers and students were engaged in their learning, not merely compliant. Suddenly rubrics were being shared from school to school. The teachers that were hooked thought the rubric was a great tool when writing their report cards.

A correlation between Quest 2000 and the new Ontario math curriculum was another important tool that my partner and I distributed among the teachers. This tool reduced the anxiety the teachers were feeling over meeting the abundant mathematics expectations.

Phase 3-The ball is certainly rolling!

Teachers in Grades 3 and 6 were in a panic about the up-coming May EQAO testing. The following were strategies being used to ease the stress. Some teachers were reviewing last year's test and needed help moving students up a level. Others were using anchor booklets and having students compare their answers to those they saw in the anchor booklets. I explained to

students how the tests were marked from my experience as a marker the year before. The overall message was getting across to students to do their best and to remember that the assessment was not recorded on their report card but would be used to help teachers improve learning the following year.

There was a sense at this time to extend my services to the Grade 6 teachers. This was a real eye-opener for me. I found the Grade 6 students struggling with the same concepts. Students were frustrated with their writing skills. They had developed a very negative attitude toward writing.

I agreed to work with the Grade 3 and 6 students in double grades to relieve the pressure the classroom teachers still felt about being accountable for the results of the assessment. The students were getting comfortable with me and seemed to enjoy the activities that we did together. It was also nice for the 3s and 6s to be together to see how dynamically they worked together in the school. I enjoyed working with another teacher in the classroom. The EQAO tests arrived. My observations: teachers were pumped; students were comfortable; parents were informed and confident in the system; principals were at ease; the staff at every school was supportive. What more could one want?

Findings and Conclusions

Upon reflection, I noticed a number of partnerships being established during the second phase. Teachers were curious as to what strategies were being used with the Grade 3 teachers. They were sharing resources with one another. One Grade 6 teacher admitted to the 4/5 teacher that she needed his cooperation in using Quest 2000 so that the load she was carrying (meaning the Grade 6 test) would be lessened. The 4/5 teacher did not realize she felt this way and agreed to help as much as possible. People were communicating with each other openly and directly

with respect. Through grade-level meetings, the teachers worked together on essential learning that a child must have to obtain success. The essential learnings were then presented to the parents by the teachers. Principals and teachers were working together to seek out consistency in their school, and provide a framework for writing and reading that built on previous learning. New resources were provided. Teachers of Grade 3 and 6 were given an opportunity to meet in small groups, led by the coordinator, to share ideas on how to implement the expectations. Relationships with the community were established with the V.I.S.I.O.N. and the D.A.R.E. programs. My job was to help in establishing agendas for divisional meetings, sharing resources from school to school, and giving workshops to parents and teachers.

As Ruth Sutton says, sometimes the learning is by trial and error and the learner has to work out what went well and what went wrong, and why, and what to do next. Sometimes feedback is provided by someone else, whose job it is to tell us what went well, what went wrong and what to do next. Sometimes we get a different kind of help from someone who encourages us to think about what we are learning by helping us to ask questions rather than providing all the answers. Student learning did improve this year but it was not solely my doing. It was the vision everyone in our system developed toward the commitment to higher levels of achievement in our students and in ourselves.

Improving My Practice for Teacher Support

Elaine Thomas
Grand Erie District School Board
Consultant

Research Question and Significance

My research question was **"How can I improve my practice to support teachers?"**

As Teacher Consultant, I work directly with teachers and administrators in supporting the various initiatives in curriculum, assessment, and special education. Though the role demands that the consultant is available to support the needs of teachers and individual schools, I must be flexible in adapting to a wide range of in-service needs. But in responding to those needs, I have to consider how I can present information and resources so that I truly address the needs. I have to consider what needs teachers and schools have and how I can best support these needs in my practice. The other concern I have about my practice is how to know that I am responding to these needs in an effective and timely manner.

The greatest challenge I believe that support staff face is supporting many system changes and provincial initiatives in a climate that is overwhelmed by change. Getting teachers to buy into these changes and accept some responsibility for the changes is the second component of the challenge. What I am discovering through the process of reflecting on my practice, is that I am changing my delivery of information and resources. I also see myself changing the manner in which I support teachers. I see these changes occurring because I have changed my opinion on how I can be effective in supporting the needs of teachers and schools.

Methodology

I began to look at some of the projects for which I had direct responsibility and I started to examine how I was working with these teachers and administrators. I found in a few situations, that I was not achieving my desired results. What I found was that I was operating under some basic assumptions about the adult learner. I believe that I was also working too hard and doing most of the learning. By so doing, I was creating a dependency within the system for further support. What I believe would be ideal would be to "work myself out of a job." This would mean that schools would become self-directed and would utilize the expertise that is present within their staff. In fact, my role should be to foster a learning community, and secondly to help support the development of a school culture that is responsive to change and self renewing.

In a quest to gain better understanding of my practice, I began to think about the ways that I learn best and about the opportunities I have had to clarify my thinking. I believe that the best opportunity I have to gain an understanding about the many initiatives I have to support is to tap into my colleagues' understandings and to actually gain a better understanding by discussing and wrestling with the details. I realized that I had the pleasure of belonging to a very rich learning community with a membership of highly trained and knowledgeable colleagues. They are my resources and I have used their expertise in trying to meet the demands of my job. This is a strategy that I rely upon in my practice. I then came to the conclusion that in my presentations I was not utilizing the expertise that existed in the room. I also did not acknowledge the need for teachers to work through an understanding of concepts by tapping into each other as a resource. I was doing all the talking and often leaving the questions and discussion to the end of the presentation when I had overwhelmed them with details and lost the opportunity to reinforce and

check for their understanding. I also realized that changing this presentation style was a high-risk activity for a teacher who could speak up and say anything during the presentation. I could not plan for changes in the presentation and at the same time, I was not adapting the presentation to the needs of the learners. The very nature of presenting, rather than discussing, eliminates the possible lively dialogue when true learning and understanding takes place. Here I am a teacher missing the 'teachable moments' with my audience, who in this situation, are really my students.

Another fallacy that I was supporting in my practice and that I believe greatly interfered with my effectiveness is the belief that I have to present "all the information." I always had tonnes of handouts, because teachers expect handouts. However the main use of handouts is to take them home and file them away and usually forget about their existence. I realized this was another reason why my efforts in implementing many of the changes in secondary school reform have failed. I know that in my practice, I have prepared binders of resources that I felt contained all the information that teachers could possibly require, only to find out that these resources sit on shelves. I also discovered from the numerous conversations that I have had with principals and teachers that early concepts that were presented were never understood, and I kept on adding new layers of resources and more information on top of a very weak foundation. I never really monitored the understanding. I never checked back with the feedback loop. I did not create opportunities for schools to provide me with the feedback I needed in order to change my practice. Instead, my initial response was to ask why the school or teacher didn't implement the initiative? I thought less of them rather than less of my instructional strategies. I realized that I needed to change my presentation style, and check for understanding throughout, and follow-up the presentation to ensure clarity and provide additional support. I was really missing the feedback to change and adapt.

Findings and Conclusions

When I consider how this changes my practice, I believe my role changes from presenter of information to facilitator. As a facilitator, how I present what I present and how I work with teachers must change. Rather than responding to the change by providing all the necessary resources, I have to work with schools and teachers in the developing understanding, problem solving for implementation, and developing strategies around implementation and managing change. I have failed in my practice because I assumed that, by giving teachers resources and by "talking at them", that they fully understand. I have also assumed that they are adult learners and they can move forward because they are motivated individuals. They are adults and they are learners and they are motivated but they need supports that learners need. Assuming that adults do not have individual learning needs was my error. I now believe that I did not understand what it truly means to be supportive. I believe that I can only be effective in helping schools to develop if I clearly understand what their needs are, how I can best present the information to them, and how I can support their understanding. I need to listen more and focus my support in a more specific, rather than in a general ways. For example I need to:

- identify the strategies and good practices that exist in schools
- support teachers and administrators in the development of networks
- coach rather than preach
- build frameworks that are models for understanding
- ask for input and follow it up in my practice
- check for understanding and follow up to monitor and support the process

I believe that my practice has changed from me identifying the needs to discovering the needs and trying to respond to them from a common sense point of view. I also believe that the

way I give support is by helping schools to build strength and become more self-reliant and confident. I feel that one of the biggest challenges that face our schools will be the loss of expertise and "corporate memory" with the numerous retirements that are occurring in the profession. Somehow we need to build up the new expertise, renew older staff members, and support the large number of new teachers and administrators in itinerant roles. We need to find strategies that create stability. As a central office support person, I see my role as creating expertise within the system rather than possessing all of the expertise. And some day, I hope to work myself out of a job.

Helping Teachers Improve Student Success

Janet Rubas
Grand Erie District School Board
Teacher Consultant

Research Question and Significance

My research question was **"How do I improve my performance so that I can support teachers to build the knowledge and skills necessary to help students be more successful?"**

When I started the action research project, I fell into the all too common trap that, as a teacher consultant, I could and should "fix things." I had the skills, the ideas, and the knowledge to improve our district's EQAO assessment. The answer was clear! All I needed to do was to develop the 'culture of assessment' and get teachers to accept the EQAO assessment results as "friendly data" that should be used to improve student learning. I started with the research question, "How do I improve my practice in supporting teachers so they accept assessment as a tool to improve learning for students?" The assessments I was focussing on were the EQAO assessments. My improvement depended on teachers changing their attitudes and then changing their practice. From my point of view, the results would get better if teachers would just analyze the results, get ideas on what they needed to improve, decide what strategies would lead to improvement, focus on those strategies, and collect data on how students were improving. What was the big deal? The EQAO assessments were just one more piece that teachers could use to be more effective in improving student learning.

I learned, however, that many teachers had a much different view of the province-wide assessment. My perception was not the one from the field. Instead teachers said:

- "the tests are designed to compare teachers and students"
- "the tests don't reflect what is really important and what is happening in the classroom"
- "the tests were set up to ensure that students ended up at Level 1 and 2 to make teachers look bad"
- "the whole procedure is just political."

It was as if we were speaking two languages. They were close to the situation and, in many cases, felt as if they were being held responsible for poor results. They were not viewing the results as a way to improve student learning but as a way for the government, the public, and the parents to determine whether they were good teachers. In a time when there is so much change, teachers were already feeling less than confident. "Just get the tests over with," was a common reaction. Given that many of the schools I came in contact with had relatively poor scores, the perception that the tests could be helpful was a frightening and foreign idea.

As I listened to teachers talking about the frustration and self-doubt that came from the testing situations, it was clear to me that just telling teachers that the data were 'friendly' or giving them suggestions as to how they might 'fix' the tests scores would never work. If the scores were going to improve, teachers had to be intrinsically involved in the process in order for them to focus on what the scores told them. They had to learn how to put the testing into the context of their classrooms, connect the data to what they were doing, and make changes to their own practice based on that analysis. It was evident that I had to change how I worked with teachers in order for this to happen. I could not just tell them what to do. I had to wait and listen

while they analyzed the data, developed their own explanations and determined for themselves where to concentrate effort.

Methodology

I had to concentrate on what I could do differently. After discussion with Ruth Sutton on the concept of corrective feedback, I realized that I was the one who required feedback from teachers - feedback on what I was doing, how I assisted or failed to assist, and what I needed to do differently to help teachers make changes. In the past, I received feedback in written form which usually gave teachers the opportunity to say what they found useful in a workshop session. In most cases, these written reflections were positive. When negative comments were made, more often they were directed not towards the content but towards the organization of the sessions (e.g. "there was not tea available.") This was not the kind of feedback I was seeking. I needed direct communication, to look the teachers directly in the eye and ask, "How have I helped you?" "What could I do better?"

At first, the prospect of this was scary for me. Yes, I am a confident individual. However, I was opening myself up to real criticism - to being told exactly that I did wrong. Would this really help to improve my performance? I realized however that if all the data are 'friendly' and I was trying to model a "culture of assessment," where feedback and assessment data are used for improvement, then the benefits of opening myself up to criticism outweighed the fact that my ego might take a beating. I was going to start modelling for teachers what I believed was necessary for them to do with the data about their students and their own performance. They needed to collect the data, review and analyze it, determine what the data provided as to clues for improvement, develop a course of action to implement that improvement, try it (test it out),

gather more data (assess), and start all over again. I was going to try to put myself in a continuous feedback loop.

I needed to provide opportunities for teachers to give me direct feedback on my performance so I could use it to improve. It was necessary for me to build into each of the teacher contacts, a commitment from them to connect again for a review, not only of my performance, but also a review of the results of the contact. Follow-up sessions should not add to the already heavy load of teachers. I needed to find a way to obtain the feedback without making them remain after school or fill out surveys on their own time. Throughout this year, I have used three basic methods for collecting 'corrective feedback' on my performance:

- let's talk over lunch (I bring lunch for the staff and review 'evidence' of my performance.)
- release time discussions (providing occasional teacher coverage so teachers can provide feedback on my performance within a preplanned discussion)
- teacher reflection (ask teachers to reflect at the beginning and end of each small group session on 3 statements or questions related to my performance in the session).

My focus had now changed. Although I had started to gather information on how to help teachers to use assessment data in the classroom (including the data from EQAO) my focus, now, was directed inward, "How will I use feedback to improve my performance as a teacher consultant?"

Findings and Conclusions

Although I have applied the feedback I collected over the year in many different ways, I want to tell a story that has forever changed the way I do my job.

The principal of a school asked that I introduce the Ontario Curriculum Unit Planner to a portion of the staff who would then, in turn, share the tool with their colleagues. Four teachers

met with me in a whole day training session in which the Planner model was introduced and then the teachers worked in pairs to use the planner to plan a unit. I had always felt it necessary for teachers to arrive with the expectations they could use in planning a classroom unit, instead of watching me demonstrate the use of the Curriculum Planner.

In this case, we worked to understand the planning model and then they planned their units (as much as is possible in one day) with assistance from me on how to navigate the Planner. A month later, when the principal released the four teachers for a morning to meet with me, the feedback proved to be unexpected but interesting;

- all the teachers found the tool interesting and helpful
- few believed teachers would readily use it for writing units because of the time commitment
- all found time-saving tools (the rubric maker) teachers would use
- neither of the pairs had finished or even worked on, the unit begun in our training session.

Foolishly, I thought I was introducing the planner in such a way that teachers would find it an indispensable tool. Once again, I was seeing the Planner from my perspective, not that of the classroom teacher. I could see all the possibilities it would provide. However, without the time to learn it and use it teachers would only skim the surface of what it could do. Just skimming the surface would not give them the commitment or insight needed to go back and use it. Using the Planner was the only way to find out how much help it could be. Based on the feedback I received from these teachers, I sat down and started to think about what would encourage teachers to go back and use it again. I recognized three things:

- teachers had to walk away from the training session with a unit that was complete enough to be useable in their classrooms. The unit had to be in the electronic format, rather than in hard copy, so that teachers would have to access the Planner themselves to get the unit,

- teachers had to be shown how units that were already complete in the Planner could be found and copied so they could be adapted to the teachers' class and grade.
- Teachers had to be shown that they could plan a unit without having to write much.
- Teachers had to be made aware of the elements of the Planner and learn how to access the elements without having to write a unit.

On the basis of these thoughts, I have designed a new training session that I now use with the teachers and have shared with other teacher consultants to use in their training workshops on the Planner. In this session, the unit we work on is 'almost' complete. Teachers write one of the subtasks. All of the others have already been finished, so that when the workshop concludes, teachers walk away with a unit that can be used in the classroom. Through the session, teachers are introduced to those elements that will be most helpful to them. They are shown how to copy subtasks, resources, and information from the Teacher Companions. They are shown how to access the expectations, achievement level descriptors, and lists of accommodations. They gain experience in using the rubric-maker.

The feedback I am receiving using this new model is very positive. One principal said, "I learned more about the Planner in two and a half hours with you than I did in three separate workshops." A teacher commented, "The unit we planned was great but even more important, I learned how to use the Planner for more than unit writing…I learned how it will make my job more manageable so I can spend less time writing rubrics, for example, and more time working with students."

I have learned through this research that I must listen carefully to teachers in order to support them. In most cases, they know what they need. This does not mean that I only present "what they want to hear." It does mean, however, that no matter what information or skill we are

working on, I must take time to find out how the ideas presented were used, or not used, in the classroom. I need to plan what I do and the supports I provide based on what teachers say is making a difference in what they do in the classroom. I know that I have changed for the better the way I work in my position as a teacher consultant.

This understanding will continue to improve my performance. I will forever be in a continuous feedback loop. I have learned that by seeking feedback, analyzing the ideas, and acting on that feedback, not only do I provide better support to teachers, I also model the assessment practice I believe teachers must implement in the classroom to enhance student learning**.** My motto has become, "listen and learn!"

Chapter 5 - Findings

This chapter describes the findings of the study under five major headings. The first three sections describe findings related to provincial test results, action research, and feedback/corrective action. The fourth section describes findings on what participants thought supported their action research within the project itself, the school, and the school system. The final section describes differences between the 1999 and EQAO 2000 provincial test scores in the schools in which Grade 3 and/or 6 teachers participated in the study.

Using Provincial Test Results

Over the last ten years, teachers have found themselves the target of media attention and government policy changes that have left many feeling threatened and undervalued. At the beginning of the study, therefore, some participants viewed EQAO test results as "unfriendly data." There was a tendency to take a defensive stance and protect themselves and their schools by explaining unfavourable results of the provincial testing on the basis of things the teachers could not control.

During the early meetings, participants felt the need to vent their frustrations about the testing. Some statements focused on the nature of the students themselves or their communities. Participants mentioned such things as the transient nature of the school population, the number of special education students in their classes, and the impact of the socio-economic status of the population served by the school. Others focused on the lack of resources available in the school. They mentioned such things as shortages of texts, manipulatives, display space and other equipment. Still others focused on perceived shortcomings of the testing itself. They wondered if the test was fair. Were the questions too hard? Was the marking scheme detailed enough to

allow students to use their time and energy effectively? Some criticized the test for relying on written responses and preventing students from asking for help when classrooms, particularly at the Grade 3 level were built around oral communication and co-operative interaction. A number suggested that the test approached problem solving, for example, in a different way than they had taught their students and used different vocabulary than their students were used to using in relation to the subject matter.

These criticisms need to be considered in order to plan for improved testing and student achievement as well as for the valid use of the test results. The important point for this study is that, at the beginning of the study, teachers were focusing their attention on factors they could not control.

Test Results as a Catalyst for Action

As the participants began to analyze the test results, they found them to be a strong catalyst for action research. In some cases the test results were surprising. They did not support the teacher's expectations. Anna-Marie Aquino, who was entering a new school for the first time, expressed surprise at the test results in that school.

> After administering the tests in the spring of 1999, the teachers involved felt confident that the students had done a good job on the test and the scores would reflect this. One could imagine their surprise and disappointment when the results arrived in the fall indicating quite the contrary. This perplexed me. Although I was not teaching in the school in question at the time, nor was I involved in the assessment process at any school at the time, I did know the teachers involved in this case, both personally and professionally. I was certain that the teachers were hard working and dedicated educators. As well, as the present Grade 3/4 teacher, I also knew many of the children

who had written the test. As a result, I was even further confused. What had gone wrong?

In other cases, the test results confirmed the prior judgement of the teacher that students were not achieving. One teacher described her response to the test results.

> Before ever being involved in administering EQAO Grade 6 testing last May, I had the persistent, gnawing uneasiness that something was not up to par. The majority of students in this particular class did not in any obvious way display an eagerness to learn to improve their efforts, to even try their best. Nor were they the least bit concerned. Later, in going over the test results with our principal, I saw no real surprises. Basically, what the students had been producing/demonstrating so nonchalantly in daily class activities was demonstrated in the test booklets. Yuk! It just looked so much more awful in this particular comparative format.

Participants found that they could readily identify patterns and areas of concern in the test results. This enabled them to focus on what they could control, gave them a reason to be involved in action research, and allowed them to see connections between the provincial test results, ministry learning expectations, and their own day to day work in the classroom. The following excerpt from a school group discussion during the first project meeting shows a teacher drawing meaning from the test results and speculating on possible contributing factors in her own practice.

> Let's go back here for a second. Remember, we talked earlier about how we're always evaluating the kids and we're telling what levels they are for writing? Is that coming out in their attitudes about themselves in their writing? But, we don't do that to them in reading. We don't say, "You're a Level 1; you're a Level 2; you're a Level 3 or 4

> reader." Because it's not as tangible in the evaluation of reading. But in writing, it's down in print; it's there forever; it's very tangible. Is that them reflecting on themselves and is that us coming back to them saying, "You're a Level 2; this is how you get to Level 3?" Because, you know, we both have rubrics up on the board and we show the kids how to get from the different levels and what problems they have. Is that a reason for their attitudes toward writing?

Effecting Movement Between Levels

During the project, many teachers saw evidence that they could contribute to student improvement within and between the Ontario Levels of Achievement. Teachers found this encouraging and it lifted their spirits. A number found, however, that it was easier to effect movement between higher levels than between lower levels of achievement. For example, Elizabeth MacLeod was trying to help students better organize their writing:

> As the students were writing their stories based on the organizers I had provided, students working at Levels 3 and 4 adjusted well. Students working at Levels 1 and 2 had considerably more difficulty. Their work was not improving. They wanted to write and not be hampered by any restrictions or particular guideline.

Maggie Sullivan found that one difficulty in improving results for students working at lower levels was in the attitudes of the students:

> I was giving them the opportunity to fix their errors by re-teaching an area in which they needed to improve and allowing them to resubmit their work for re-evaluation. Unfortunately, I did not have a lot of students who took me up on the offer of making changes in order to move to a higher level. They were quite satisfied with a Level 1 or 2… In some cases, I would make suggestions but they would not make the corrections

and I would get the same thing back again. I was surprised at the lack of interest students demonstrated in making corrective changes in their work.

Some teachers found trying to improve scores frustrating because the underlying problems seemed to be more deeply rooted than anticipated. Anda Kett worked with five of her weakest students and concluded:

> The students are hesitant to participate orally in class and need encouragement and prompting to do so. Even personal discussions with them are very one sided, with the teacher/adult always leading the train of thought. It seems that these children have had little practice expressing their ideas up to this point in their lives and that little encouragement has been provided in the area of relating ideas to each other. For them, asking questions - who, what, where, when, why, and how - will need a lot of modeling, encouragement, and practice. Unfortunately, these skills are needed in many areas of school in the Junior years and these students are just beginning to be aware of them. Teaching questioning and thinking skills needs to be started earlier in the Primary years with support by parents in order to prepare the child for the increased demands of the curriculum.

To effect movement between levels of achievement, participants found that the teacher and students had to have a very clear idea of the differences between the levels and be able to show what work at the higher level looked like. George Neeb wrote:

> In class I use rubrics before the students start an assignment, so students know what is needed for a Level 3 and what I am looking for in a Level 4 response. I sometimes ask students in a math response, "What do you think would be a Level 3?" I use the terminology regularly (Level 3 means you are doing what is expected. Level 4 means

> you go beyond…you solve the problem in a highly creative way.). I have also shown the students the actual rubrics for the Provincial Assessment. Although the rubrics are very general, we still have a lengthy discussion on what each section means. When we take up practice tests together, I model answer responses based on the rubrics sent by EQAO.

To improve student learning, participants also found that they had to carefully plan how to teach the material. As Karen Dunn put it:

> My recent path of reflective teaching has reinforced the need to be conscious of the strategies I use to teach. In the current educational climate, teachers have been forced to deal with large amounts of rapid change. I find that, if I am not careful, I focus my attention on "what to teach," and leave the "how to teach" as an afterthought. This is something that I must always be conscious to avoid.

To effect movement, it was also critical for teachers to teach, evaluate, and re-teach in different ways until they found strategies that worked for all of the students. For example, Julie White was having difficulty teaching all her students to organize their ideas prior to writing a first draft. Finally, she discovered a teaching strategy that worked:

> Along with the story map, I decided to give students a writing prompt to encourage creativity and help them to come up with an idea to write about. The prompt included two illustrations – one illustration depicted a problem and the second one depicted the solution. Students needed to use the story map to organize their plot around the two pictures. Each student was able to use this strategy successfully.

After a number of frustrating months modelling appropriate work for low achieving students, Maggie Sullivan found that additional adult support in the classroom led to improved results:

> In the spring, I modeled how to do a science fair project from the beginning of finding a topic and the big question to writing summary and conclusions and preparing a display of the project. The quality of this project was good. I believe the modeling was successful. I had many more Level 3s and 4s than 1s and 2s. The project was very hands on with lots of interaction with adults. At that point in my classroom, I had a student teacher, an early childhood education student, and a volunteer as well as myself. We all worked individually with the students to ask questions, give feedback, and help put their projects together. Adult involvement with this project helped keep the students on track. Instant feedback regarding questions helped the students stay focussed.

Maggie Sullivan's experience suggests that significantly improving results for lower achieving students may require increased individual attention and support from adults in the classroom.

A number of participants found the key to improvement was to get students actively involved in their own learning and assessment. Karen Dunn began having students use a very specific feedback sheet to assess their own writing and found that it changed the responsibility level in the classroom:

> The feedback sheet brought a new dimension to our writing sessions. It forced the students to be more reflective of their writing. It was in this reflective stage that they also had to take ownership for their writing. If they did not have what was expected on the feedback sheet, they had to go back and make changes. This tool gave me additional time to spend with the students who needed it. The higher level writers were now more independent and the ones who needed me now had a framework to formulate questions to ask for help. The weaker students were now asking for help not hiding.

Teachers found that using rubrics also helped students to take responsibility for their own learning and to improve their performance in relation to the Levels of Achievement. Together, teacher and students developed the rubric in language the students could understand. Students then evaluated their own work based on the rubric, rating it Level 1, 2, 3, or 4. They also wrote explanations of why they had chosen that level and what they would have to do to raise the work to the next level. The students then revised their work based on the evaluation. Over time, they became more active learners who took the lead in improving their writing. As one student put it:

> The rubric was helpful to me because now I know what a Level 1 and 2 is and so on. If I got a Level 2 and wanted a Level 3, I would look at the rubric and see what I could improve. This experience made me a better writer.

There was also evidence that improvements in one subject increased competence in another. This was certainly the case between Language and Mathematics. Better reading and writing skills improved the ability to understand mathematics questions and to explain answers. For example, when George Neeb was struggling to improve his students' ability to communicate required knowledge in Mathematics, he saw a connection between the strands in the Language and Mathematics curricula.

> Since the Grade 6 provincial assessment is a written test, the ability to communicate has an effect on all other math scores. Students are expected to do the following when solving a math question, tell what they know, tell what they are going to do, and solve the problem using words, numbers, and pictures. They are also expected to clearly describe in writing their thinking and understanding of concepts using appropriate mathematical terminology and symbols. All of these expectations may be (affected by) poor communication scores…

Some participants also reported that improvements in Language and Mathematics resulted in improved learning in other subject areas including Social Studies and Science.

Changes in Teachers' Attitudes Toward the Test Results

As teachers began to focus on what they could control, their energy and optimism seemed to increase. There was less venting about the tests, and they took the initiative to undertake improvements to their practice based on analysis of the test results. Anna-Marie Aquino described how her approach to planning and teaching changed as a result of analyzing the data:

> Although it is unfortunate that the 1999 results were not as one would have hoped, some good did come out of the process of analyzing the results. Ruth Sutton states that in order to make assessment efficient and useful, we must use it in our teaching. To assess and then not to use the valuable information one can gather from it is a waste… The cycle Ruth Sutton proposes includes: developing one's intentions for teaching; making the expectations clear to the students, teaching to the expectations, assessing results, analyzing and reflecting on the assessment, and developing new intentions for teaching based on the analysis. The crucial stages are analysis, reflection and "feeding forward" to develop the next intentions for teaching and learning. Personally, I fell down when it came to analyzing the results and using them to start the cycle anew. Being forced through the process of analyzing the results due to poor scores naturally led me to use the conclusions to form next intentions for teaching… After analyzing the Grade 3 scores, I felt there was a need to make some simple adjustments in the strategies I used to teach that might enable the students to perform better.

Some participants found that improving test results included teaching students how to write the tests and giving them practice in doing so. Nancy Davis and Sharon Harrison applied

Ruth Sutton's feedback/feedforward process to address poor achievement on the provincial tests and found that student performance improved:

> We administered the 1999 test in January 2000 and found the results still disappointing. The students did not apply the strategies we had taught them. Using corrective feedback on the test questions, showing them exemplars of Level 3 and 4 answers, and allowing them to rewrite answers brought significantly better results when we repeated the 1999 test again in April.

By the spring 2000 all but one of the participants in the study were looking forward to this year's testing to see if changes in practice they have made will result in improved scores. Margaret Juneja expressed her increased confidence in the ability of her students to perform on the upcoming tests.

> This year's testing has not started but is coming up shortly. I (don't know for certain) whether my (new) method of teaching math this year has been effective in increasing the scores. However, I am sure that my class's attitude toward math has certainly improved. On the whole they are eager learners always willing to try and display both confidence and competence in their approach to math. For myself, I am excited about this way of teaching math problem solving skills. I can see results clearly in the written responses that the children give.

This is a big attitude change toward the testing. Teachers and students find the testing less mysterious and frightening. There is less stress and greater comfort in meeting the expectations of the provincial tests. Marg Kelly expressed it this way:

> In retrospect, EQAO testing has remained a mysterious, stressful happening that no one ever seems to enjoy - especially **not** the children **or** their parents. Although I had been in

> the same school for three years while the Grade 3's encountered this **dreaded** event, I never really **saw** the tests or knew what the illusive preparation entailed. I only heard of time limits, tears, quiet independent work, more tears and fears of the test and results. Today, when reflecting on my first personal experience with EQAO last year, I recall first and foremost the feeling of being absolutely, fully lost, unguided, uncertain and unsure about **so** many details for the **full** year...and not being able to come up with the answers. This year, after this action research activity and EQAO-related workshops, I am certain I am heading in the right direction at the very least. I see my class this year so relaxed and self-confident. They are certain that they really know what to do. My students may not accomplish each task in **complete, precise** detail but at least they are not thoroughly frustrated and crying. No one has put the pencil down and just quit. Some students this year finished a touch ahead of the time limit in a variety of tasks, **not** because they were lost about **how** to tackle the problem, but because they **recalled** the procedure, and were more secure in what they should think, write, and do. Now if only the actual results reflect this confidence!

At the conclusion of the study, participants indicated that they would continue to use provincial testing as one source of data about the effectiveness of their teaching practice. The ongoing cycle of annual provincial testing was seen as valuable to help the teacher, school, and community to focus on what they can control and choose common goals for improvement.

There was still one teacher who said he does not place much credence in the testing because of all the variable circumstances affecting results. By and large, however, most now see testing as a tool that can provide information on the strengths and weaknesses of their practice. They see EQAO test results as "friendly" data, although they continue to be concerned about

what they see as misuse of the test results in the reporting process. The following quotation by Janet Rubas is representative of the thinking of many.

> I think the school board and province should back up what is said about the EQAO assessments with appropriate action. If, on one hand, it is said that the results are in no way meant to compare schools, teachers, and boards, EQAO and the province need to make strong statements about how the results should be used. Local boards and communities that rank schools should be reprimanded. Any misuse of the results (real estate companies citing results for "good neighborhoods") should be chastised. Teachers must get the message that the results give information, not to compare teachers, but to help teachers do an even better job. Given the political climate, I'm not sure this is possible.

Action Research

Participants' responses to action research were overwhelmingly positive. Most initial concerns about extra workload, expressed in the early meetings, evaporated as teachers began to see positive impacts on students. Although one school left the project because of other priorities, no "May fatigue" was evident among participants. As the year progressed, participants' energy levels did not decline but in fact seemed to increase as they saw the results of their efforts and prepared to report on what they had accomplished.

In reflecting on their experience with this project, participants saw how action research impacted on their basic and fundamental beliefs about teaching and learning. It helped a number of teachers clarify and confirm their values. Linda Gorden wrote:

> I always believed that if students knew what you expected exactly and how they were to achieve their mark, they would do better. The use of rubrics and modeling and self/group evaluation has shown this to be true.

On the other hand, some teachers found that action research helped them to rethink basic and fundamental beliefs they had held about teaching and learning and to better incorporate them into their practice. At the conclusion of the study, Janet Rubas wrote:

> As a teacher I have always considered myself to be a learner. I learned alongside my students. I don't think I brought this value to my position as a teacher consultant to the same degree as I acted upon it in the classroom. I was more likely to think of myself as the one who was supposed to have the answers. This process has taught me that when it is made clear that I am learning along side the teacher and they have as much to share with me as I have with them, the communication and feedback is more open and can lead to improvement for both.

For some teachers, action research enabled them to address doubts about fundamental beliefs they had had about teaching and learning but heretofore had been unable to address. The project enabled them to resolve value conflict. Anna-Marie Aquino put it this way:

> I always felt odd about giving an assignment and not really knowing how I was going to evaluate it. Unfortunately, I didn't know how to fix the problem. Through action research I became more aware of techniques such as the use of rubrics and assessment criteria that made me a more effective and accurate assessor. I also now feel better prepared in terms of being able to justify the marks I give.

The Process of Action Research

Participants used a process of action research based on the work of Jack Whitehead and his colleagues (McNiff, Lomax, and Whitehead, 1993) that included a number of phases. Teachers began by analyzing data from the provincial tests and identifying a question about their own practice. Then they began to address that question for the purpose of improving student learning by developing, implementing, and assessing different ways of teaching. During the process, teachers collected and analyzed data about the impact of their efforts and further modified their change initiatives based on their findings. Throughout, teachers recorded their action research in their journals and worked with critical friends to support each others' efforts. The process culminated with teachers writing a report on their research so that their experiences could be shared with others. The following sections of this report discuss participants' experiences with each of the phases.

Asking questions about practice.

When teachers began to analyze their school/class provincial test results, they were easily able to identify general areas of concern from the data. For example, when George Neeb analyzed his data, he was concerned because far more of his students scored at Level 1 or 2 in Mathematics than in Reading or Writing. He wondered why his students scored more poorly in Mathematics and decided to focus on analyzing the Mathematics results. In doing so, he found that larger numbers of his students scored Level 1 or 2 in problem solving, understanding of concepts, and communication of required knowledge than in the application of mathematical procedures.

When Diane Clark analyzed her data, she became concerned about the differing attitudes and performance of boys and girls:

> When looking at the 1999 EQAO provincial assessment results for the Grade 6 students, the varying attitudes of males and females toward mathematics was quite surprising. The percentage of girls who, on the questionnaire, stated that they liked math was a disturbing 33 whereas 73% of the males liked math. Even more striking was the difference in attitude when asked if they were good at math (girls 33% and boys an overwhelming 80%). This did not seem right to me because I knew that I had many very strong girls who appeared to be confident when doing math, felt comfortable when volunteering answers, wrote long explanations in their math journals, and met a lot of success on daily assigned work and tests. I then examined the actual concrete levels of achievement in the EQAO assessment and my suspicions were confirmed; more girls than boys had achieved Levels 3 or 4 on the math components of the assessment. Why did 67% of the girls think they were not good at Mathematics?

By identifying a general area of concern in the data, teachers came to see discrepancies between the expectations they had for student success and the actual results of their teaching. The resulting cognitive and emotional conflict led teachers to try to find explanations for the discrepancies. Once they began to focus on what they could control, their attention turned to their own teaching practice and how it might be contributing to the problem they identified. They began to ask, "What am I doing or not doing?"

Identifying a general area of concern and one's own responsibility for it, tended to cause some teachers to question their own competence in a general way and to experience disturbing emotions associated with self doubt. For example, Marg Kelly experienced strong doubts about the quality of her own teaching in relation to the new Ontario Curriculum:

> Worst of all, I sensed inadequacies welling up within myself. Was I using the right texts? – in the right ways? And what was the right way, now since everything was changing "for the better" with this new massive curriculum, this precise number of expectations, with "leveling" instead of "grades" or "marks", and with "exemplars."

One key benefit of action research was to enable teachers to move beyond the identification of a general area of concern and to develop a manageable focus for their improvement efforts. Developing a clearly-defined research question helped teachers make this step. Participants were encouraged to begin their research questions with the phrase, "How can I…," to clearly focus on action as well as research. They were also coached in how to refine the question to make it measurable and manageable within the eight-month time line of the project.

The research questions developed by participants are recorded in Chapter 4. Analysis of the questions produced the following patterns.

By far the most frequently chosen area of investigation involved improving students' communication skills. Thirteen teachers emphasized this area in their questions. Ten of these teachers were concerned about improving writing ("How can I improve the writing skills of my Grade 4 students?). Smaller numbers were interested in a broader range of communication skills including oral and reading skills. Two emphasized the organization of ideas in communication (How can I improve students' organization of ideas in their writing?) and two others included reference to improving the use of clear terminology. Five of these teachers specifically connected improving communication skills to improving results in mathematics ("How can we improve written communication in mathematics?).

Five teachers focused on how to use a specific teaching skill to improve students' performance. Four of these wanted to use modelling more effectively (How can I use modeling

in the classroom to promote the use of clear, concise terminology in written responses?"). One connected the use of modelling and math journals ("How could I use modeling in math journals to help students explain answers more fully to obtain higher levels of achievement?)

Some teachers' questions looked at other ways of improving students' performance in Mathematics. Two of these teachers wanted to improve thinking and problem-solving skills in mathematics ("How can I help to make my class efficient problem solvers while increasing their knowledge of the basic math facts?") Two teachers focused on gender issues particularly in regard to the performance of female students in Mathematics ("What can I do to make the classroom less gender biased during math lessons so that both boys and girls feel comfortable and challenged with lessons, assignments, and the curriculum?"). One teacher focused her question specifically on improving results for her weakest students (How can I effectively improve the language skills of my weakest Grade 4 students to meet grade level standards?)

All of the consultants' questions focused on developing their effectiveness in helping teachers improve student learning. Three consultants emphasized helping teachers use more effective teaching practices. One focused on how to build the trust relationships necessary to influence teachers' practice. Another specifically mentioned the subject areas of reading, writing, and mathematics. One included an emphasis on how to introduce new curriculum.

There was a great deal of commonality among the questions teachers asked across the two school boards. This may be because there were similar kinds of patterns of provincial test results between the two school boards. However, it may also be that teachers looked for a research question that gave them leverage on a number of different areas of concern. For example, many participants focused on improving writing skills because they thought that improving those skills would benefit scores not only in reading and writing but also in

mathematics. The following excerpt from a discussion at an early meeting of the project shows teachers using the concept of leverage as they worked to develop their action research questions.

> Teacher 1: The comment that I made at the staff meeting was that I was surprised by the math results…how low the math results were. I can't remember the exact conversation but the point that was made to me in return was it was the language in the math that made the math so difficult. It wasn't the actual doing of math. It was that the kids weren't able to decipher necessarily what question was asked, and what information they were supposed to give.
>
> Teacher 2: And some of those questions had two and three steps to them, too…which the kids aren't able to filter out…in order to do the first part…And if they couldn't do the first part, they couldn't get the second part.
>
> Teacher 1: …I think that that's one of the areas that we need to work on. For example, when the board consultant came and taught students how to use "pictures, words, and numbers" to explain their answers, it was great, and it was so much easier for the kids… I think that there are a lot of strategies that we can use to improve math scores that are not going to be as difficult as revising the whole math program.

The process of working from a teacher's general area of concern to produce a manageable research question took time, effort and support to accomplish. Long conversations with critical friends, during and apart from project meetings, played an important role in the process. Some participants changed their questions a number of times before they arrived at the final form. For example, Liana Thompson and Diane Clark's initial area of concern had to do with girls' performance in, and attitudes toward, mathematics. They asked the question, "Why do more girls than boys believe that they are not succeeding at math?" Through discussion, they

modified the initial question to focus on what they could do to improve the situation, "What can be done in the classroom to ensure that more girls feel increased confidence and self esteem when doing math." As they worked on, and talked about, their action research over the course of the school year, Liana Thompson and Diane Clark modified their question further to focus on connecting math and science to girls' lives ("What is the stimulus to foster positive attitudes for girls towards the importance of math and science in their lives?"). Finally, they became concerned about how males could be part of their question and they wrote, "What can we do to make the classroom less gender biased during math/science lessons so that both boys and girls feel comfortable and challenged with lessons, assignments and the curriculum?"

Planning and carrying out a study.

In essence, the teacher as action researcher used the scientific method, repeatedly and with many variations. The process was fluid with false starts, blind alleys, and frustrations as would be expected of a creative process. It required hard thinking, ongoing discussion with critical friends, and the injection of ideas about feedback/corrective action by Ruth Sutton and Diane Morgan during workshop sessions. In the following passage a participant summarizes an hour-long discussion with critical friends in which they explored possible hypotheses that might provide starting points for investigating their research question:

> So far, this is our question, "How can I improve my teaching practice to help create more effective writers?" Our students need a lot of work in writing and particularly in the organization of ideas so we thought of different strategies, some that I've never used before, that we've learned today like "teach and re-teach." We listed a couple – four or five actually – of different strategies but we decided to start with one and work on that and journal on it and see the effectiveness of it, and then move on to another.

As teachers planned how to begin their studies, they were encouraged to plan how they would collect evidence to show the impact of their work. The participant goes on to summarize plans for data collection:

> Some of the evidence we'd be looking at… We'd be taking samples of our students' (work) right in September and taking samples right now and we'd start implementing our strategies and then collect more samples… We'd take their writers' notebooks, look at their comments, look at their attitudes in class, and work on the rubrics with the students and have the students do more peer evaluation and self evaluation. And that would be part of our evidence collection. But we'd also include our own narrative writing in our journals as part of the evidence collection.

The evidence teachers collected was used to make subsequent decisions about how to proceed with the investigation. In some cases, the results of initial experiments required the teacher to modify the original plan. For example, Anna-Marie Aquino introduced a rubric to her students so they would understand exactly what they had to do at each level of achievement. She found that, initially, students had difficulty with the concept and she adjusted her teaching accordingly so everyone could understand:

> I started by presenting the children with a rubric for written responses. At first they were overwhelmed by all of the information, so I decided to break the rubric down into its component parts and deal with each one individually. We started with Reasoning and discussed each of the elements of Reasoning in detail, providing simple examples of what would constitute Level 1, 2, 3, and 4 responses. We did this over the span of two days until everyone was comfortable with the information. After completing the rubric, the students had a clear understanding of the framework in which to build their answers.

> They could also accurately predict the grade or score the piece of writing would earn before they handed it in.

When the first experiments were successful, teachers used them as a basis for further development of their projects. Anna-Marie Aquino continued her project by modelling performance at each of the levels of achievement:

> The next step was to offer models of expected performance at each of the levels based on the rubric introduced earlier. The first attempt produced results that were very encouraging and motivating. We read a story together. Afterwards the children were required to respond to a question about the story. I scribed their answer on the blackboard for the whole class to see. The students then assessed the response based on the rubric and decided that the response was at Level 1. I allowed the students to make any changes to the response that they wished in order to improve it and I wrote the changes on the blackboard. I tried not to interfere or prompt with leading questions. In fact the students not only improved the response, but were also able to point out solutions to problems I had not recognized myself! I kept the initial response and revised responses as evidence of the impact of this activity.

When the initial experiments were unsuccessful, the teacher cast about for other strategies to try. The result in some cases was a number of alternative ways to address the same problem, one of which eventually got the results the teacher wanted. For example Elizabeth MacLeod found that the writing organizers she taught her class worked well with students at Levels 3 and 4 but not with students at Levels 1 and 2. She decided she needed to do something different if they were to succeed:

> Their writing was not moving in an organized way. They wanted to write unhampered by any restrictions or particular guidelines. After a discussion with my critical friend, therefore, I followed the plan she was implementing in French writing. I had these students illustrate their story ideas as "beginning," "middle," and "end" and then write a few sentences about each illustration. Through this method, the students started to see the organization of a story. Together, we added connecting words and then expanded the ideas. The results were much more positive.

Six participants experienced substantial frustration at particular points in the project. Frustration occurred when teachers could not see evidence that their changes in practice were rewarded by improvements in students' performance. For example, Maggie Sullivan found it difficult to see that her substantial efforts to help a few low-achieving students to improve their writing had had much impact. In her journal she wrote:

> I am beginning to wonder at this very moment if I am focusing on the right thing. Perhaps I need to look at (students') levels of apathy toward learning before I try to change or improve writing habits. It seems to me that I have tried a number of proven strategies, but the students do not respond. The students seem to think that whatever they put down on paper is the final product and that's the best they can do with no area for improvement.

During the course of the project all but one of the participants who experienced frustration resolved their difficulties. One felt that her research question was still unresolved and intends to continue it next year.

Feelings of frustration appear to be a normal part of the creativity of investigations of this kind. They occur when teachers have difficulty achieving their goals. Such feelings dissipate as

issues are resolved. The critical friend played an important role in helping participants through such episodes.

Collecting data.

Participants took the collection of data about their action research very seriously. Their research reports contained direct references to evidence that was used to assess the impact of their work. Table 5.1 shows the kinds of data that teachers collected.

Table 5.1

Kinds of Data Teachers Collected

Kinds of Data	Examples	Frequency
Teacher collection of student products	• products not intended for publication or display: daily log books, notebooks, daily writing booklets, vocabulary dictionaries, story planners, graphic organizers, story maps and prompts, completed work sheets • finished products for publication and display: presentations, book talks, oral reports, formal speeches, projects, student constructed models, student generated writing assignments, responses to literature, examples of problem solving, portfolio work, independent home projects, student generated bulletin boards, student generated flip chart, "how to" manuals, evidence of transfer of learning to other subjects (e.g. science fair	61

	projects), • student self and peer assessment: student generated rubrics, peer evaluation of speeches based on a rubric, peer editing based on a rubric, self evaluation based on a rubric, feedback sheets	
Teacher observations	• individual students: oral use of language, student participation, transfer of learning to other subjects, ten-based cubes, students' use of terminology, response to reading, listening, responding and telling stories, rehearsing stories for writing, student analysis of rubrics • groups of students: whole class discussion, small group discussion, peer conferencing/editing, peer modeling, collaborative writing sessions, TAGs (teacher advisory groups) • student choices and reactions: students book choices from library, students' career fair choices, student reaction to 1999 and 2000 provincial tests • classroom climate	49
Teacher communication	• parents: interviews, report cards (comments, strengths/weaknesses/next steps), newsletters, informal communication (home/link program, ongoing discussion about weak students,	32

	spontaneous comments received from parents) • students: student/teacher conferences, spontaneous student comments • colleagues: feedback from peers on conference presentation, discussion about student attitudes with other teachers, discussion of student progress • experts: readings, presentations • administration: principal	
Teacher use of journals	• teachers' journals or entries • students' journals: mathematics, language	26
Teacher use of test results and materials	• provincial tests: 1999 tests, replicated provincial tests, replicated provincial test items • other tests: daily quizzes, unit tests	21
Teacher designed Visuals	• photographs • videotape	6
Teacher developed questionnaires	• student responses	2

There were 61 instances in which participants reported the use of student products as data. These included products not intended for publication or display like notebooks, journals,

and worksheets; finished products for publication or display like writing assignments, speeches, and presentations; and students' self and peer assessment of their own work including the rubrics they developed.

There were 49 instances in which participants reported the use of observation as data. This included observation of individual students, including how they listened, responded, and used terminology; groups of students, including large and small group discussion; student choices and reactions, like choices of library books and reactions to tests; and changes in overall classroom environment.

There were 32 instances in which participants reported the use of communications as data. This included communications from parents including report card comments, and interviews; students, including conferences; peers, including discussions; experts, including readings and presentations; and administration, including the principal.

There were 26 instances of the use of journals as data. Eighteen participants referred to their own journals that they were asked to keep as part of the participation in the project. Eight teachers mentioned using students' math and language journals as data.

There were 21 instances in which participants reported the results of testing as data. All teachers reported using the provincial test results. There were also a few uses of replicated provincial tests or test items and other quizzes and tests.

Finally, there were six instances in which teachers used visuals, like still photographs and video, as data, and two instances in which teachers asked students to complete questionnaires.

The consultants in the project relied more heavily on their journal entries and observations as data than on hard-copy examples of work by teachers and students. The consultants worked by preparing sample resources for teachers and by demonstrating their use in

workshop or classroom situations. They used subsequent discussion with the teachers and principals as data on their effectiveness in the role of system leader. They had been involved in the development of the boards' action plans for responding to the EQAO testing and had analyzed the provincial test results in that context.

Participants expressed initial concern about being asked to keep a journal in which they recorded their action research. Some were concerned about the time journal writing would take. Others wondered what value there would be in keeping a journal. Some were concerned about handing in a private journal for others to read. One teacher wrote:

> Do I enjoy writing in journals? No. Do I normally write in journals that express my feelings? No. Will I write in this one? I'll try. Will I do a good job? Who knows. Will I share my journal? Certain aspects. But please, if you expect me to hand it in, in total, I expect to know about that minor detail from day one. Then I would focus solely on school/classroom aspects and happenings…

Irrespective of these concerns, all teachers did use their journals during the study and most handed in either the complete journal or excerpts along with their final research reports.

Analyzing data and making adjustments.

During their action research, participants analyzed their data in a variety of ways. Examples can be seen in Chapter 4 in the summaries of teachers research reports. Teachers demonstrated their use of the following kinds of analysis to measure the impact of their efforts in terms of student progress. They compared:

- student work to provincial test results.
- report card results to provincial test results.
- student work to earlier report card results.

- student work to earlier work by the same student.
- student work in various subjects and languages
- results of discussion in various teacher advisory groups (TAGs)
- student results to provincial exemplars and exemplar rubrics
- expert opinion about teaching with their own practice.
- their own journal entries to earlier entries

The opportunity to discuss their data with others contributed greatly to the analytical process. "Fresh eyes" helped the teacher toward findings that might have been missed if the teacher had been working alone. However, working with parents, colleagues, and critical friends also enabled teachers to assess their findings and conclusions. The responses of others to the same data helped teachers' to validate their action research projects. Participants used the following validation methods:

- parents help analyze test results
- other teachers re-mark students' work
- a critical friend reviews the teacher's data and talks through findings with the teacher
- a teacher discusses his/her data/findings/conclusions at action research project meetings
- a teacher presents his/her study at a conference and receives feedback (e.g. the Act Reflect, Revise 2000 Forum and the OERC- Act, Reflect, Revise 2000 Conference)
- a teacher submits his/her research report to the Ontario Action Researcher for peer review and possible publication (www.unipissing.ca/oar/).

Drawing conclusions.

Teachers drew conclusions from their studies about effective teaching methods. For example, Joyce Johnson concluded that she would continue to use certain teaching methods in the future:

> In conclusion, I discovered that if I am to improve student organization of ideas in their writing, I must provide my students with formative, on-going assessment of their work… My students need evidence of their learning and progress. This action research project pointed out a very important purpose of student portfolios. From now on, the students in my classes will be able to see their own progress as together we assess their organization of ideas in their writing from one assignment to the next.

For some, the conclusions exhibited a tremendous sense of optimism and excitement. Margaret Juneja's conclusions included this paragraph:

> I am sure that my class's attitude toward math has improved. On the whole they are eager learners, always willing to try and displaying both confidence and competence in their approach to math. For myself, I am excited about this way of teaching math problem solving skills. I can see results clearly in the written responses that the children give. I focus more on the process the children use rather than the product. I give them much more corrective feedback, both oral and written. Seeing a child smile when you tell her what a great answer she has certainly is a wonderful reward.

Some teachers expressed genuine surprise at what they found. Such feelings of surprise at the findings of a study are a good indicator that the researcher has found something new and important rather than merely what was expected. Anna-Marie Aquino wrote:

> At the beginning of my reflective teaching journey, I perceived my goal as creating a climate where the learners demonstrated effective results in their daily writing and ultimately on the Grade 3 assessment. The biggest surprise that has captured my heart was the change it made in me. My corrective action has been an awakening of responsible teaching. The results will continue to grow and shape as I encounter new students each year.

A number of teachers identified areas for further research that they wished to pursue as a result of their study. Fran Lainson wrote:

> I believe that parents need to take more responsibility to help students achieve success in school. I am not totally certain how this can be accomplished but I have some ideas I would like to try. If students begin doing problem solving with parents at home, in the Primary grades, and continue the practice through the Junior grades, perhaps the attitudes and interest of the students and parents will be more positive.

Maggie Sullivan, who experienced some frustration in her attempts to improve weaker students' learning and motivation, concluded with ways in which she would modify her own action research study during the next school year. She wrote:

> I would organize my project differently. This time I tended to focus on my whole class and in the future, I would focus on a small group of students with a very specific question geared toward the group. I would like to focus on working with this small group of students for a specific amount of time each week and use the teaching strategies that I mentioned earlier.

Recording and sharing.

Initially, many participants expressed concern about having to write their research reports. They were concerned because they were unaccustomed to this kind of writing and tended to think of research writing as the purview of the academic. In addition, teachers have not generally made it a practice to explain what they do, why they do it, and what the results are.

By the time they had finished their studies, participants wanted to communicate what they had found out. They were asked initially for a four-page, double-spaced report in 12-point type with examples and other data attached as appendices. As the time for producing the reports approached, participants asked if they could increase the length, because they said they needed more room to describe what they had done. A six-page report was then agreed to be the target.

The reports the teachers produced were longer and more comprehensive than anticipated. Reports ranged from 4 to 9 pages in length with the average being 6.6 pages. However, all but two reports were single-spaced rather than double-spaced and two reports were in 10-point type. Appendices ranged from 0 to 20 pages in length with the average being 7.1 pages. Most of the appendices were examples of rubrics and student work.

Consultant reports ranged from 4 to 9 pages with the average being 6.6 pages. All were single-spaced. One of the reports was in 10-point type, the rest in 12-point type. Appendices ranged from 0 to 21 pages with the average being 4.8 pages. One consultant provided most of the appendices. These appendices gave examples of student work obtained when she had teamed with a classroom teacher as part of her consultant's work.

Further to the issue of sharing, at the beginning of the study, some participants expressed concern about the possibility of being asked to give presentations or lead workshops about their action research. However, as with the writing, participants' concern lessened as they continued

with their research and discovered that they had something they considered of value to share. By the end of the study in June 2000, most participants had shared their research formally or informally within their schools and there was increased confidence about accepting invitations to lead workshops.

Involving Others in One's Action Research

Many participants informed their students about their action research and encouraged them to take an active role in improving their learning. Students responded to such invitations and took greater responsibility for self evaluation and responding constructively to formative evaluation.

Some participants informed colleagues about their action research and actively involved them in the investigations. Karen Dunn wrote about the positive impact joint marking had on staff relationships and understanding.

> Other teachers were… involved in my marking since we are all on a learning journey together. This activity helped create bonds of trust within our teaching staff. Staff members often share planning but assessment, the critical component in education, has traditionally been an isolated activity. This peer marking provided healthy conversation and it confirmed the need for universal marking standards.

Some participants informed parents about their action research and actively involved them in efforts to improve students' skills. For example, each week Sharon Harrison sent home a mathematics "problem of the week" for parents and students to solve together using the problem solving techniques Sharon was teaching. She recalled the impact of the strategy:

> Now the class consistently solves problems using all three techniques… At the beginning parents were writing notes saying they had difficulty helping their children explain the

> answers. (After a time the notes stopped coming.) Parents expect the problem of the week and have made comments such as, "Keep sending them. My child is getting better at thinking them through. I am learning how to rephrase questions beginning with the words describe or explain."

Liana Thompson and Diane Clark presented their action research at the year 2000 Act, Reflect, Revise Forum in Brantford, Ontario and involved participants in their session in providing feedback. They learned a great deal as a result:

> Realizing we learn best from others, we asked conference participants to provide written input and experiences in relation to our action research topic and were pleased with the sharing going on in the room.

At the conclusion of the study, all participants said they would continue to use action research although two continued to express concern about the amount of time it took and whether that time would be available in the future. Many felt that action research increased their feelings of purpose and professionalism. Rosemary Conlon summarized the reasons she would continue to use action research in this way:

> (Action Research) forces me not only to think but to keep a record of my thoughts. It's like looking through a photo album or a video of the past. It teaches me about how everything had grown and helps me to reflect on what to do next.

Feedback/Corrective Action

As the project progressed, participants became increasingly enthusiastic about feedback/corrective action. The enthusiasm developed as teachers used the approach in their classrooms and saw students improve their skills and take increased responsibility for their own learning.

Many participants wondered initially how they would find the time for more intensive assessing, responding, conferencing, and goal-setting activities in an already crowded school day. However, participants found ways to make significant aspects of feedback/corrective action a regular part of their practice. Many described students who had started the year poorly but had made remarkable gains. Rosemary Conlon wrote:

> I see (feedback/corrective action) as essential for a student's academic and personal growth. It gives the student ownership or responsibility for his/her actions. It gives them a clear direction as to where I as the teacher want them to go. It gives me evidence to use with parents when I need to prove my "accountability." It gives parents a chance to help their children reach a desired level and it gives students another chance to reach their goals.

Intense conversation with critical friends and during project meetings helped participants begin to use the language of feedback/corrective action. Using the associated terms – like rubric, modeling, scaffolding, and feed-forward - seemed to help improve teachers' understanding of the innovation. The project leaders encouraged teachers to use the language of feedback/corrective action in their reports and they did so successfully.

Feedback/corrective action uses a number of assessment and teaching strategies with which teachers are already familiar. The approach, however, integrates these strategies in new ways and with new strategies. The result was that participants felt their current professional knowledge was honoured and that the approach helped them to improve that knowledge and to use it more effectively. The process enabled teachers to amalgamate new and existing methods under a paradigm that they found got results.

The Process of Feedback/Corrective Action

Analysis of participants' action research reports showed use of a variety of strategies that reflect elements of feedback/corrective action as recommended by Ruth Sutton (1995, 1997). Putting these strategies together produced repeated cycles of expectations for student learning, models of exemplary work, practice, constructive feedback, corrective action, and goal setting.

Expectations for student learning.

Teachers devoted increased time to clarifying their expectations for student learning and communicating the expectations to the students. If students are clear about what is required of them they are in a position to work toward the expected results. Beginning from the learning expectations and levels of achievement of the Ontario Curriculum, the EQAO test results, exemplars, and anchor booklets, teachers developed and discussed with the students rubrics that were used consistently as the basis for assessment, feedback, and goal setting. Some had students actively involved in the development of the rubrics that would be used to evaluate their learning.

Rubrics are grids that describe several levels of performance related to a number of identified criteria. The use of rubrics not only clarified expectations but also enabled students to assess their own work and take responsibility for their own improvement. At least one participant remembered Stiggins (1993) maxim, "Students can reach any target that they can see and will stay still for them."

Models of exemplary work.

Many participants relearned the power of modeling as a key teaching approach. Once expectations were established, teachers modeled the skills in a variety of ways. For example, they used direct instruction methods to demonstrate practices and clarify processes related to the

levels of achievement in the rubrics. Margaret Juneja demonstrated problem-solving strategies. Marg Kelly led her students in writing and revising sentences on the blackboard to demonstrate improvement. Julie White and her students wrote a story together to model the writing process. Betty McLeod analyzed stories with her students to model story structure.

Examplars were drawn from published work, EQAO anchor booklets, and students' own written and video-taped work. Teachers used modeling in full class and individual and small group settings, including student conferencing. Consultants provided teachers with models of best practice and showed them how to incorporate them into classroom work.

Teachers also provided "scaffolding" to support students' learning. The scaffolding was in the form of detailed step-by-step directions or graphic organizers for a skill. For example Julie White used a story map to teach the organization of ideas in writing. Once students began to grasp that skill, the teacher gradually removed the scaffolding by providing less and less detailed instructions for the work. In this way, students could become more independent and able to add their own personalities and creativity to the process.

Practice.

Teachers gave students lots of opportunity to practice the skills they were learning (like how to organize their writing) moving from highly directed practice to independent work. Practice was related to many different problems and subjects to maintain and develop student motivation and demonstrate the usefulness of the skills in a variety of contexts. Many of the resulting student products were assessed.

Constructive feedback.

Teachers provided constructive anecdotal feedback about student work based specifically on the rubrics. Feedback was given to the students on feedback sheets, sometimes on the rubric

itself, and through student/teacher conferencing. As students became more adept at using the rubrics, self and peer assessment was increasingly used in many of the classrooms. Essentially the feedback showed students reasons they had scored at a particular level in the rubric and gave advice on how to revise the work to reach the next level of performance.

Corrective action.

Once students had received feedback on a piece of work, teachers gave students opportunities to revise, and resubmit the work for re-evaluation at a higher level. In testing, teachers would mark and provide feedback on the test, re-teach key skills or content to some students as necessary and then re-test those students, recording the second mark for report card purposes. This process enabled students to see the benefit of improving their work and allowed them to demonstrate increasing mastery of the skill or content.

Goal setting.

Teachers met with students to analyze their progress in relation to the rubrics and worked with students to develop goals for further growth. Through this "feed-forward" process of goal setting, many students became more able to take responsibility for their own learning by becoming aware of their strengths and needs for improvement. A number of teachers saw growth in students' ability to self-evaluate during conferences and in their learning journals.

Focusing the students' attention on their progress rather than their mark enables them to take responsibility for improving their own learning. When students and teachers could see progress, success bred success. Students had to know what constituted progress - where they were; where they were going, and what steps they needed to get there.

At the conclusion of the study, all participants said that they would continue to use feedback/corrective action. Participants found that they changed their evaluation processes to

include more formative evaluation and more provision of second chances for students to upgrade results. Teach, assess, set goals, re-teach, and retest became a formula for results. Teachers found that effective formative evaluation had to provide very specific feedback in relation to the expected learning results and also had to provide specific suggestions on what to do to improve results. It enabled students to take responsibility for their learning and enabled parents to contribute to their children's progress.

Support for Action Research

Participants identified a number of factors that helped them in conducting action research. They also made comments about what they thought would provide additional support. These views were consistent among participants across both school boards.

Participants identified focused dialogue with other teachers who were also involved in action research as a powerful source of help. Talk enabled teachers to share successes and failures, think through their questions, plan their projects, analyze their data, and to draw conclusions with some validity.

Monthly Meetings

Talk during the monthly project meetings was particularly helpful. As Janet Rubas put it, "It brought together a dynamic group of people who were committed to the project and the process." Sharing information about the various action research projects in large and small groups was a key component of these meetings and one of which participants never tired. Participants reported that the meetings were morale boosters because they helped keep participants focused on what they could control. The meetings enabled participants to talk about their own research questions and projects, to clarify their thinking, and to develop alternative

courses of action. The meetings also enabled the group to celebrate the accomplishments of individuals and to share winning ideas.

By attending the meetings, participants had the opportunity to see a bigger picture - the problems, thinking, and solutions from a number of schools. Participants from the Grand Erie District School Board attended the fifth annual Act, Reflect, Revise Forum in Brantford and appreciated the opportunity for discussion with teachers from a wide variety of Ontario school boards and with national and international leaders in action research.

Participants felt talk was so important for success that they wanted even more opportunity to do so. Some wanted more large group discussion at each stage of the action research process and others wanted more time to talk with critical friends about their own individual projects. Some participants wished that a list-serve or chat room could have been established to link participants to one another on-line. Others wished that there had been an opportunity for them to meet individually with a facilitator to discuss their projects and receive assistance. Participants wished the project had begun earlier in the school year. In both boards, teachers indicated that they wanted more talk and work time leading up to and including the writing stage.

Participants also appreciated the portions of the meetings that provided input into action research and feedback/corrective action. In fact, the context of action research seemed to contribute to participants' openness to new ideas that they believed could help them answer their research questions. They appreciated the contribution of the guest speakers and found the workshop sessions helpful in providing alternative teaching strategies and a forum to discuss ways of integrating them into existing practices.

Overall, participants found that the meetings developed increased levels of professional confidence. There was an appropriate balance between receiving new information and having the opportunity to process it through talk and action. The process confirmed participants' professional competence while enabling them to evaluate and improve their classroom practice. As one participant put it, "(The meetings) brought out knowledge in me that I didn't know I had."

It is not surprising, given the emphasis on feedback/corrective action that, by the end of project, participants in both boards wished that they had received more specific directions about expectations for the project. Some asked for a formula for conducting an action research project and a specific required format for the final research report. Others indicated that it would have been helpful to receive examplars of journal entries, rubrics and final action research reports.

Project Leaders

Participants found the project leaders helpful. The leaders focused a substantial portion of each meeting on enabling individual participants to discuss their own projects and they provided an environment in which participants found it safe to engage in open and honest discussion. They also provided questions or goals to focus the discussions, without unduly limiting them. Participants said that the leaders encouraged participants' in their research, listened to them, validated their existing skills, and provided immediate feedback. Participants also appreciated the amount of work time and consultation time provided during meetings devoted to writing their research reports and they liked having computers provided for their use during these meetings.

Critical Friends

The teachers' critical friends played an invaluable supportive role. Participants enjoyed having a partner readily available with whom to share successes and failures. Critical friends provided encouragement, perspective, and ideas that contributed to solving problems and working through the frustrations of developing new teaching practices.

Some participants who did have a critical friend in the school suggested having a larger school team involved in the project. Others said that action research should be a school focus to investigate particular topics like improving student learning in mathematics, and using math journals. All teachers wished they had more time to talk with teachers in other schools about action research.

Both teachers who did not have a critical friend in their own schools commented on how much they missed that level of support. Not having a critical friend within easy reach seemed to increase the frustration felt when a barrier was encountered and made the teacher feel isolated. As Julie White said, "The meetings were really helpful but occasionally I wanted to run across the hall. Only one other teacher in the school was slightly interested." Maggie Sullivan wrote:

> A team of two teachers from the same school is an ideal situation for action research… I was alone in my school and formed a partnership with a participant in another school. We agreed to email each other once a week to keep each other up-to-date on our projects. Even though it was beneficial to have a partner from another school, I would recommend partners at the same school so that people who see each other every day can talk to each other about their projects. I found that more dialogue helps one to reflect and concentrate…on the action research question.

The critical friend was not only a source of support but also a partner in bringing information to other teachers in the school. One teacher wrote:

> I discovered quite quickly that the best part of this action research experience is having a colleague at school who attends the same meetings and who is "there" regularly to conference with – even at the most unusual times, in some rather unique ways and encompassing some unusual topics. (My partner's) casual use of "specialized" terminology in the staff room piqued the interest and curiosity of other staff members. Sometimes they even momentarily gave the impression that perhaps they were actually missing something important, interesting, and useful.

The consultants did not seem to be as dependent on having a critical friend nearby. This may have been because they enjoyed more flexibility in their use of time than did classroom teachers and were able to more easily build and access support networks. Moreover, they seemed to gather energy from the teachers with whom they worked. As Elaine Thomas reported in her questionnaire at the conclusion of the project:

> I feel rejuvenated and encouraged by teachers. I also see teachers working together as a support network and motivated to improve their practice. I feel we need to foster a professional community to support our personal growth, firstly because this is our obligation as professionals and secondly because no one else will do it for us.

School and School System Context

Participants appreciated the support for this project that they felt from their principals and also from the school boards' curriculum coordinators and consultants, superintendents, and directors of education. They felt that they were part of an important project and were being supported to address areas of concern for their schools. Particularly, participants identified as a

source of help the willingness of principals to adjust timetables and, with the support of the school board, to provide release time. Some participants felt that they were also receiving support from parents and colleagues for participating in the project.

Participants were concerned about school colleagues' lack of understanding about action research and what participants were doing. They wished that school staff understood that EQAO testing is more that just a problem for teachers of Grades 3 and 6. "If test scores are to improve substantially, it will require the efforts of teachers in all grades."

Some teachers found talking with colleagues who were not involved in the project to be a significant source of help. Seeking the advice of a colleague required the courage to admit that one needed help. Finding a colleague willing to provide assistance was rewarding and reduced the hesitancy to seek help in the future. Marg Kelly, a very experienced teacher, described seeking help from a younger, long-term occasional teacher:

> At first I avoided (using math journals) because I wasn't clear on how to guide or encourage my students. When I tentatively tried, I saw some progress, but not what I gathered should be evident, particularly after consulting the EQAO "sample answers book" from the May 1999 test. I finally trudged down the hallway seeking help. The greatest, most valuable help I received in using the "dreaded" math journal came from a pleasant, approachable, knowledgeable young lady on yet another long-term placement at our school. In January, I swallowed my pride again and in desperation asked her, "What did our consultant do? How do you go about doing….? Could I see a completed sample…?"

Lack of time was frequently mentioned as a hindrance, particularly lack of time at school to meet one's critical friend and to confer. Some suggested that if action research became widely conducted in a school, release time for divisional meetings might be used for this purpose.

Since this was a first endeavour for the teachers of the Nipissing-Parry Sound CDSB, participants from that school board wished that the board would continue to provide professional development opportunities in action research. Some suggested providing recognition (like course credits) for conducting action research that could be included in teachers' professional records. Participants asked that this action research project be continued to take into account the year 2000 EQAO test results, to add new participants, and to enable current participants to share their learning with new participants.

One consultant recommended that another project like this one should involve all teachers from one school rather than a few teachers from many schools. "It would be interesting to see this project work on a whole staff and the results it might have on student improvement."

EQAO Results 2000

In November, 2000 the Grades 3 and 6 participants and the principal researchers analyzed the schools' results of the year 2000 EQAO testing and compared them to the results of the 1999 testing. This analysis helps validate the assessments of the teachers regarding their degree of success on improving students' learning. While it is recognized that there are a multitude of factors that affect test results and that it may not be possible to say that the teachers' actions caused changes, the comparison of the test results is encouraging and most teachers themselves believe that their efforts contributed to improvements.

It is appropriate to use school results in this analysis because the participating schools in both school boards are small enough that the Grade 3 and 6 participants in the study constituted the full complement of teachers in those grades in each school.

When the 1999 and 2000 EQAO test results were compared for all Grades K-6 schools in the Nipissing-Parry Sound CDSB, there was an overall average improvement of 9% in Reading, 10% in Writing, and 6% in Mathematics in Grade 3. In Grade 6 the overall improvement was 10% in Reading, 8% in Writing, and 7% in Mathematics. When a similar comparison was conducted for all Grand Erie DSB K-6 schools, there was an overall improvement in EQAO Grade 6 test scores in Mathematics of 7%. In all other subjects in Grades 3 and 6, there was no substantial change in results between 1999 and 2000 with increases or decreases of only 1% or 2%.

Seven of the nine schools in the research study had teachers participating who taught Grades 3 or 6. In 6 of those seven schools, the improvement in test scores between 1999 and 2000, related to the teachers' action research questions, substantially exceeded the school boards' improvement averages. Karen Dunn at Corpus Christie focused on improving students writing skills. Her school's writing scores improved from the 1999 figure of 55% of students in Levels 3 and 4, to 82% in 2000. Anne Marie Aquino at St. Alexander focused on improving written communication skills in reading, writing, and mathematics. Her school's scores in Reading improved from 22% of students in Levels 3 and 4 in 1999, to 52% in 2000. In addition Writing scores improved from 32% to 42% and Mathematics scores improved from 30% to 46%. At St. Gregory, Linda Gorden and Marg Kelly focused on using modeling to improve the use of clear concise terminology in written responses and oral presentations. The school's Writing scores improved from 25% of students at Level 3 and 4 in 1999, to 46% in 2000.

At North Ward, George Neeb focused on articulating the reasons for problem solving in mathematics. The school's Grade 6 scores went from 24% in overall achievement in Levels 3 and 4 in 1999, to 41% in 2000. At Bloomsburg, Margaret Juneja focused on the structure of problem solving models in Mathematics. The school's Grade 3 scores went from 21% in Levels 3 and 4 in 1999, to 77% in 2000. At Lynndale Heights, Diane Clark and Leanna Thompson focused on girls' attitudes toward Mathematics. The school's Grade 6 test results improved from 33% of girls reporting that they liked and felt they were good at Mathematics in 1999 to 50% in 2000. The number of boys who liked and felt they were good at mathematics remained constant at 80%.

In one school, the results were less clear-cut. At St. Joseph, Joyce Johnston and Elizabeth MacLeod focused on improving students' organization of ideas in writing. The Grade 3 Writing scores went from 31% at Levels 3 and 4 in 1999, to 50% in 2000. However, the Grade 6 scores did not improve overall in Writing. In addition, at North Ward, Sharon Harrison and Nancy Davis focused on improving levels through the use of exemplars. Although, they reported improvement in motivation, the changes in results on the 2000 EQAO Grade 3 testing were not appreciable. This finding supports Jack Whitehead's assertion at the December 2000 Ontario Educational Research Council Annual Conference in Toronto that, due to a variety of circumstances, not every action research project will result in a "victory narrative." (MacLure, 1996).

Chapter 6 - Discussion/Conclusions

This chapter reports on the conclusions, limitations and implications of the study. The chapter concludes with recommendations for quality improvement.

Conclusions

This study contributes to understanding what happens within the "black box" (Black and Wiliam, 1998) of the classroom that contributes to improvements in student learning based on provincial test results. It also contributes to the literature on what constitutes effective teacher in-service education. Conclusions are presented regarding the use of provincial testing, action research, and feedback/corrective action to improve student learning.

Provincial Testing

The study shows that teachers' attitudes toward provincial testing are a significant factor in determining the use and usefulness of the test data. Once teachers feel that the data, given its limitations and imperfections, can be used positively to improve student learning, teachers are willing and able to analyze the test results, identify the strengths and weaknesses of their students, and to undertake initiatives to effect improvement. This study demonstrates that, given adequate encouragement and support, teachers can overcome initial defensiveness to view the provincial test results as "friendly data" that they can use, along with other assessments, as a source of information on student learning.

Teachers can learn to analyze the test results in order to identify problem areas and research questions. They are also able to initiate and carry out research to address those questions in terms of improved practice. Because students learn in many different ways and at different rates, achieving learning expectations for all students is likely to increase when professional teachers conduct these kinds of investigations on an ongoing basis. Therefore,

while recognizing the many variables that affect students' results, the annual testing can, over a numbers of years, provide ongoing feedback to inform teachers' efforts to improve instruction.

It is also likely, as students improve in relation to the kinds of performances required in the tests and have increased experience working with the kinds of questions that are asked, that they can become less fearful of the test situation itself and can become more successful.

It must be recognized, however, that improving test scores is a complicated process involving a multitude of factors. A teacher's best efforts may not produce improved scores particularly in the short term. To get results, teachers of all grades need to focus on the required learning expectations, not just teachers of Grades 3 and 6.

Teachers' morale improves when they focus their attention on what they can do to improve student learning rather than on the many factors that are beyond their control. Professional confidence increases as teachers see that they can influence student learning in ways that improve test scores and as they see their teaching methods validated through their analysis of data. Teachers feel greater confidence in their communication with parents and are able to involve parents more effectively as sources of help in their children's education.

To say that teachers should focus on what they can control does not mean that teachers should stop being concerned about what they cannot personally address in their own classrooms. However, when they focus attention on the things that are within their control, they feel more optimistic and able to make a positive difference on their students and communities.

Furthermore, the study suggests that, under favourable circumstances, analysis of the provincial test results may enable the school and its community to agree on initiatives that can create the kind of learning organization envisioned by Senge (1990). Students, teachers, administration, and parents improve their vision and mastery individually and collectively.

Where parents are engaged with the teacher in the research process, problem-solving, communication, and understanding of the teaching-learning process is strengthened.

Improving results for lower achieving students is indeed challenging. The study suggests that, to do so, teachers need to have at their disposal a rich repertoire of teaching and formative evaluation methods. In addition, they also need to possess the ability to customize the use of those methods to meet the specific needs of the students in their own classes. This is particularly true of assisting students in improvement from Level 1 to 2. The EQAO examplars and anchor booklets were found helpful in increasing student attainment of expectations.

Improving test scores requires substantial classroom time and student effort which, on one level, can been seen to take time away from achieving learning expectations in other subjects. On the other hand, the study suggests that integrating language and mathematics with other subjects can benefit learning in all areas.

Teachers need to feel supported, encouraged, and recognized for taking the initiative to improve student learning. It is important for them to vent their frustrations before they can commit to the research process and implement change. Many teachers feel undervalued and may also feel threatened by change initiatives emanating from the provincial government. To see EQAO data as "friendly," teachers need to be assured that the data will not be used inappropriately to compare schools or judge teachers. It is more beneficial to judge a school on its ability to improve the achievement of its own students than simply to compare its results with those of other schools.

Action Research

This study was inspired by, and based on, the work of Jack Whitehead at the University of Bath, U.K. Action research was the method teachers, in this study, used to improve their own

practices in relation to the provincial test results. The study supports the research on inquiry as a fundamental adult learning strategy (Knowles, 1973; Tough, 1971) and reflective practice as a means of professional improvement (Schon, 1983). It also supports the research on self study and action research as professional development (Auger and Wideman, 2000; Delong and Wideman, 1998; Ghaye & Ghaye, 2000; Hamilton, 1999, Whitehead, 1988; Wideman, 1992, 1995;). There is ample evidence that inquiry is a learning strategy professionals, including teachers, use effectively to improve their practice.

In order to conduct effective action research projects, an individual must have an inquiring mind. While inquiry is the starting point, the practitioner must also develop a meaningful, manageable, and measurable research question and plan and implement a rigorous investigation. Justifying claims to knowledge requires validation by others (Mcniff, Lomax, and Whitehead, 1996).

When teachers ask questions of the kind, "How do I improve my practice?" they are asking value questions and often creating personal dissonance. Fundamental to the action research process is facing the question, "How can I live my values more fully in my practice?" Frequently when this question is pursued, teachers may find that they are what Jack Whitehead (1998) calls "a living contradiction" - not acting in accordance with their values. Consequently, they are faced with changing the way they teach.

Developing a meaningful, manageable, and measurable research question is a difficult process that is not readily understood by many. Developing a good question often takes time and repeated cycles of action and reflection. When teachers model reflection and action in their own work, they develop in their students a similar capacity.

The study supports the importance of sharing the results of teachers' action research. Such sharing contributes to improving student achievement on a wider scale by creating a body of educational knowledge about teaching and learning. The teacher becomes a creator of knowledge not merely a technician and lends his or her voice to the literature on education. Contributing to the knowledge base of the profession builds teachers' confidence, credibility, and accountability.

Educational literature informs, but cannot replace, the teacher's personal investigation of how to improve learning in his/her own classroom. Each individual does have to "reinvent the wheel" in order to reconstruct, integrate, and extend the knowledge. Teachers must share what they know so others can take it into account and use that knowledge as a starting point. However, improving one's own teaching is a process of individual investigation and discovery.

The study shows that action research provides powerful support for teachers who are working to improve their own practices through inquiry. Teachers use the methods of the researcher to formulate research questions, experiment with possible solutions, collect and analyze data to show the impact of their actions, and to record their studies so their learning is explicit and can be shared with others. Moreover, action research provides critical friends to support the teacher in the often difficult and sometimes anxious self-reflection that is part of the change process.

Action research is a learning process for which there is no fixed formula. Beginning action researchers frequently ask for a set of rules. However, the process of personal discovery and individual meaning-making is so fundamental to the approach that emergent design is the primary methodology. Even in collaborative action research projects, the individual is the primary investigator.

The study shows that when teachers themselves identify a meaningful problem with their practice, they take responsibility for resolving it and therefore become directors of their own professional growth. Under supportive circumstances, EQAO test results can stimulate this kind of question asking either by validating concerns of which teachers are already aware or by raising discrepancies between what teachers believe to be the results of their teaching and the test results.

Allan Thomas (1980) used the term "learning occasions" to describe situations in which the professional realizes that habitual practices no longer work and require revision. Under such circumstances, the teacher moves away from what he or she formerly believed to be "tried and true" and ventures into a process of learning through "tests and trials." Participants found that action research enabled them to move away from over-reliance on established practices and to enlarge their repertoire of practices by experimenting with new teaching and assessment methods in a systematic and constructive way.

The study suggests that in today's hectic teaching climate, there is a need to enable teachers to slow down enough to think carefully about the effectiveness of what they do. Under supportive circumstances that reduce defensiveness, such activity opens the door to professional renewal, school-based school improvement, and more balanced attention to both the "what" and "how" of teaching. Teachers develop a deeper level of understanding of sources of low achievement and a richer repertoire of teaching strategies. The study suggests that teachers are now familiar enough with the Ontario Curriculum to begin to integrate learning across subject areas, and, therefore, to emphasize language and mathematics skills across the curriculum.

Teachers in the study found that relatively small changes in their classroom practice effected substantial improvements in student performance and, therefore, increased teachers' morale and feelings of efficacy.

The study shows that action research facilitates the transfer into actual classroom practice of learning from workshops and presentations. It enables the teacher to connect theory and practice. Identifying a research question and determining to solve it created in participants a need for new strategies. Participants applied ideas from the workshops, evaluated them, and further developed them to fit their own circumstances.

Finally, action research honours teachers' professional knowledge by enabling teachers to reshape their established practices into more effective forms and combinations. Through cycles of purposeful experimentation and reflection, participants were able to clarify and reflect on their own professional knowledge and to reshape and enlarge that knowledge into more effective forms. These creative cycles of experimentation provided opportunities to learn from successes and failures in an environment that fostered risk-taking. Many of the individual strategies of feedback/corrective action, such as direct teaching, modeling, use of task sheets, anecdotal assessment of student work, and conferencing, were not new to participants. However, investigating their action research questions enabled participants to evaluate their current use of these strategies, modify them, and combine them in new ways under a richer theoretical framework. Taking knowledge that had become tacit and making it explicit was a fundamental step in this process, one that was facilitated by journaling and by focused conversation in a safe environment with critical friends.

Feedback/Corrective Action

The study reinforces the benefits of feedback/corrective action as a valuable tool for teachers - one which provides sure and certain direction for implementing effective formative evaluation and for integrating evaluation with teaching, learning, and reporting.

Feedback/corrective action operationalizes results-based learning. Students can become responsible partners in their own learning when they understand the specific expectations and assessment criteria under which their work will be evaluated. The use of rubrics and exemplars in this study gave students clear, consistent direction for their learning and provided a foundation for developing skills in peer and self- evaluation. Over the long term, students can develop as autonomous learners able to identify and correct their own mistakes. Corrective feedback and feed-forward enables students to gradually master the concepts being taught and design goals for their own learning that result in higher achievement.

Teachers employing the feedback/feedforward loop found they were able to combine this newer strategy with already-established strategies such as designing rubrics and writing the strengths, weaknesses, and next steps section on the provincial report cards, making all of these more effective in combination.

Feedback/corrective action demonstrates the importance of providing students with anecdotal feedback on their progress rather than merely marks or grades. Despite public perceptions, marks or grades by themselves, provide no pertinent information to students or parents about the student's growth and about how to improve performance.

Support for Action Research

The study demonstrates dramatically the need for teachers to engage in structured talk about their practice as a way of processing data and clarifying their thinking. Teacher talk

requires an environment that supports collaboration, risk-taking, and sharing. It also requires time away from the constraints of the classroom. Teacher talk produces new ways of thinking and deeper reflection.

The need for teachers to have within the school at least one critical friend cannot be over-emphasized. Critical friends create the kinds of collegial environments that enable teachers to risk trying new teaching, learning, and assessment methods. There is reason to believe that building the kinds of learning organizations envisioned by Senge (1990) depends on the development of supportive and trusting relationships among staff.

School support for action research includes not only encouragement by administrators but also the provision of time within the instructional day. The imperative of action that is so much a part of the school climate must be tempered by the provision of time for evaluation, reflection, and planning. The term action research communicates the need to balance action with reflection.

Teachers need encouragement and support to record and share their action research. Frequently, they do not see themselves as writers. However, their confidence and commitment to sharing their studies increases when they have something clear to communicate, are proud of what they have accomplished, and can support their findings with evidence.

Limitations of the Study

There are several factors that may be seen as limitations of the study. Firstly, the findings of this study are not generalizable in the traditional sense. However, the methodology has been shown to result in findings that are representative beyond the participants involved. Nonetheless, to further verify the findings, it would be beneficial to duplicate the study in other school boards, with secondary as well as elementary teachers, and to include a greater number of males among the participants.

Secondly, participants volunteered for the study and this may have affected the results. However, action research, by its very nature, requires a voluntary commitment. For this reason, working with a group of volunteers is an appropriate strategy to study an activity that is entered into at the discretion of the individual teacher.

Thirdly, the judgements of the participants, that their action research resulted in improvements in student learning, are based on analysis of data they themselves collected. However, the participants used a variety of validation strategies in their work, including the use of critical friends and these are reported in Chapter 5. In addition, the results of the 2000 EQAO testing strongly supported the action research of 9 of the 12 Grade 3 and 6 participants. It is recognized that a large number of uncontrollable variables affect the results of provincial tests and preclude claiming clear cause/effect relationships. Because of the complexity of improving test results, it would be beneficial to conduct similar research in a multi-year context and to include among the data analysis of several years' EQAO test results.

Implications of the Study

The study suggests that teachers should be encouraged to analyze the results of international/national/provincial/state testing and use them as a basis for action research. Action research should be a part of the school improvement plan. It should also be recognized as a valuable form of professional development and should be included among the criteria for teacher re-certification and performance appraisal. Whereas the literature is clear that classroom practice is unlikely to be changed by traditional courses and workshops alone, there is ample evidence that action research facilitates the integration of theory and results in changes in classroom practice.

Since action research and feedback/corrective action are relatively new in many jurisdictions, there is a need to provide teachers with ongoing opportunities to become proficient in these areas. There is also a need to provide support for action research in terms of time, relationships, recognition, and materials. This would include increased resources to establish and maintain research departments in district school boards.

Furthermore the use of feedback/corrective action facilitates the writing of anecdotal comments for communicating student achievement to parents on report cards and invites parents to be partners in the learning process.

There is a concern that teachers may be reluctant to conduct action research because of the erroneous perception that research is within the purview of the academic rather than the practitioner. While practitioner researcher is gaining more respect in the academic world (Anderson & Herr, 1999), ironically, it is slower to make its way in to the world of the practitioner and the elementary and secondary education environments.

Specifically, the authors suggest the following implications for educational decision makers. School authorities at the national, provincial/state, school board, and/or school levels should:

- use international/national/provincial/state test results as a basis for individual school improvement rather than for inappropriate comparison of teachers and schools
- recognize action research as a means of professional growth and accredit it for teacher re-certification and performance appraisal
- encourage providers of pre-service and in-service teacher education to develop courses on action research and to use action research as a learning method in other courses

- encourage providers of pre-service and in-service teacher education to include feedback/corrective action in courses on the assessment and evaluation of student learning
- emphasize the provision of constructive anecdotal feedback to students in all reporting
- include time during the instructional day for teachers to analyze their schools' test results and to plan action research for improving student learning
- support an integrated learning approach to the teaching of language and math skills across the curriculum
- encourage providers of international/national/provincial/state tests to produce examplar booklets, and other resources that support teachers' use of action research and feedback/corrective action for the purpose of improving student achievement related to the tests
- recognize and encourage teachers' contributions to student learning and to the body of knowledge on education by supporting publication of their action research reports.
- encourage university/school board partnerships to support and publish teachers' action research.
- fund multi-year research projects focusing on how action research impacts on the improvement of test scores in specific schools over a period of years.
- support the establishment and operation of research departments in individual school boards or consortia of school boards.

As a final note, the effectiveness of this study depended to a great extent on the quality of the partnerships that exists among the investigators and their organizations. While organizational support is essential, the individuals create the relationships. Such relationships cannot be legislated or forced. Trust, commitment to improving student learning, willingness to share tasks,

and open communication were shared values that provided the glue that enabled the study to be conducted effectively.

References

Abbey, D. (Ed.). (1999-2000). Secondary Action Research website www.action-research.org.

Albers Mohrman, S., Wohlstetter, P., and Associates. (Eds.). (1994). *School-based management.* San Francisco: Jossey-Bass Publishers.

Anderson, G. (1991). "The living question of school improvement and school effectiveness". *Education Today, 11*(2), 29,31.

Anderson, G. & Herr, K. (1999). "The new paradigm wars: Is there room for rigorous practitioner knowledge in schools and universities?" *Educational Researcher 28* (5) (12-21)

Anderson, G. & Jones, F. (2000). "Knowledge generation in educational administration from the inside out: The promise and perils of site-based, practitioner research." Paper presented at the annual meeting of AERA in New Orleans, Louisiana.

Anliker, R., Aydt, M., Kellams, M., Rothlisberger, J. (1997). *Improving student achievement through encouragement of homework completion.* Master's, Action Research Project, Saint Xavier University and IRI/Skylight.

Auger, W. And Wideman, R. (2000). Using action research to open the door to life-long learning for pre-teachers. *Education, 121*, (1).

Bangert-Drowns, R.L. and others. (1991). "The instructional effect of feedback in test-like events". *Review of Educational Research, 61*(2), 213-238.

Barnes, S. (1981). *Synthesis of selected research on teacher findings.* Report No. 9009. Austin, Texas: Research and Development Center for Teacher Education.

Belcourt, M. and Saks, A.M. (1998). Training methods and the transfer of training: A research report. *The Canadian Learning Journal, 2*, (1, 2, and 3).

Black, P., & Wiliam, D. (1998). "Inside the Black Box: Raising standards through classroom assessment". *Assessment in Education 5*(1), 2-21.

Bodone, F.M., & Addie, K.L. (1999). *Teaching in a standards-based system: How teachers' voices can influence policy, preparation, and professional development.* Paper presented at the Annual Meeting of the American Educational Research Association, Montreal, Quebec.

Bonczar, T.P. and Easton, J.Q. (1983). T*he effect of mastery learning on student achievement.* Chicago: Center for the Improvement of Teaching and Learning.

Brandt, R. (1989). "On misuse of testing: A conversation with George Madaus". *Educational Leadership,* 46, 26-29.

Brinkerhoff, R.O. and Montesino, M.U. (1995). Partnerships for training transfer: Lessons from a corporate study. *Human Resource Development Quarterly, 6*, (3), 263-274.

Brookbank, D., Grover, S., Kullberg, K., Strawser, C. (1999). I*mproving student achievement through organization of student learning.* Master's Action Research Project, Saint Xavier University and IRI/Skylight.

Burhorn, G.E., Harlow, B.A., Van-Norman, J.F. (1999). I*mproving student motivation through the use of multiple intelligences.* Master's Action Research Project, Saint Xavier University and IRI/Skylight.

Carter, K. (1998). "Action research in partnership: establishing teachers as key players on the school effectiveness stage". *Educational Action Research, 6*(2), 275-303.

Catlin, K.S., Lewan, G.J., Perignon, B.J. (1999). *Increasing student engagement through goal-setting, cooperative learning and student choice.* Master's Action Research Project, Saint Xavier University and IRI/Skylight.

Champagne, A.B. (1997). "Teaching to the test". *Basic Education.* Washington: Council for Basic Education.

Charbonneau, N.L., & Ribar, L.L. (1999). *Increasing student motivation through the use of multiple intelligences and cooperative learning techniques.* Master's Action Research Project, Saint Xavier University and IRI/Skylight.

Cizek, G.J. (1998). "Filling in the blanks: Putting standardized tests to the test". *Fordham Report. 2*(11).

Conley, D.T. (Ed.). (1993). *Roadmap to restructuring: Policies, practices and the emerging visions of schooling.* University of Oregon: Eric Clearinghouse on Educational Management.

Connelly, F. M. & Clandinin, D. J. (1999). *Shaping a professional identity: stories of educational practice.* London: Althouse Press.

Couture, M., Delong, J., Wideman, R. (1999). What we have learned leading a collaborative development project. *International Electronic Journal of Leadership in Learning (IEJLL), 3.* Available at http://www.acs.ucalgary.ca/~iejll

Dana, N.F. (1992). *Teacher leadership through collaborative action research: Implications for teachers, principals, and university researchers/teacher educators.* Paper presented at the Annual Meeting of the Pennsylvania Association of Colleges and Teacher Educators, Grantsville.

Dana, N.F. (1993). *Teachers for change: An elementary school collaborative program for enhancing school climate.* Paper presented at the Annual Meeting of the American Educational Research Association, Atlanta.

Darling-Hammond, L. (1997). *The right to learn: A blueprint for creating schools that work.* San Francisco: Jossey-Bass Publishers.

Darling-Hammond, L. (2000). "Teacher quality and student achievement: A review of State policy evidence". *Educational Policy Analysis. 8*(1).

Davey, L., & Neill, M. (1991). *The case against a national test.* Paper based on testimony presented by M. Neill to the Subcommittee on Select Education, House of Representatives. Washington: ERIC Clearinghouse on Tests, Measurement, and Evaluation.

Davis, W., & Mahoney, K. (1999). *The effects of computer skills and feedback on the gains in students' overall writing quality in college freshman composition courses.* Georgia.

Delong, J. & Wideman, R. (1996). School improvement that honours teacher professionalism In N.. Halsall & L. Hossack. (Eds.) *Act, Reflect, Revise, Revitalize* (pp. 15-17). Mississauga, ON: The Ontario Public School Teachers' Federation.

Delong, J. & Wideman, R. (1998). Action research: School improvement through *research-based professionalism*. Mississauga, ON: The Ontario Public School Teachers' Federation.

Delong, J. & Wideman, R. (Eds.). (1998-2000). *The Ontario Action Researcher*. http://www.unipissing.ca/oar

Donmoyer, R. (1996). "Educational research in an era of paradigm proliferation: What's a journal editor to do?" *Educational Researcher*, *25* (2) (19-25)

Donmoyer, R., Lather, P., Dillard, C. (2000). *Paradigm talk revisited: How else might we characterize the proliferation of research perspectives within our field.* Interactive Symposium at the Annual Meeting of AERA, in New Orleans, USA.

Dunning, P. (1999). "Overcoming the odds: A case study in success". *Education Canada*, *39*(2), 18-19.

Foster, W., Gaa, N., Nowicki, J., Ross, V. (1997). *Improving academic success by increasing student engagement in the learning task.* Master's Action Research Project, Saint Xavier University and IRI/Skylight.

Fullan, M. (1982). *The meaning of educational change*. Toronto: The OISE Press.

Fullan, M. (1993). *Change forces: Probing the depths of education reform*. London: Falmer.

Ghaye, T. (Ed.). (2000). *Reflective practitioner.* Vol. 1, 1. London: Taylor & Francis.

Ghaye, A. & Ghaye, K. (1998). *Teaching and learning through critical reflective practice.* London: David Fulton.

Guskey, T.R., & Easton, J.Q. (1982). *The characteristics of very effective teachers in urban community colleges.* Paper presented at the Annual Meeting of the Eastern Educational Research Association, West Palm Beach, Florida.

Halsall, N. & Hossack, L. (Eds.) (1996). *Act, reflect, revise, revitalize*. Mississauga: The Ontario Public School Teachers' Federation.

Hamilton, M. L. (Ed.). (1998). *Reconceptualizing teaching practice: Self-study in teacher education.* London: Falmer.

Haney, W., & Madaus, G. (1986). *Effects of standardized testing and the future of the national assessment of educational progress.* Working paper for the NAEP Study Group.

Hargreaves, A. (1994a). The changing world of teaching in the 1990s: Helping teachers make changes themselves. *Orbit*, *25*(4).

Hargreaves, A. (1994b). *Changing teachers, changing times: Teachers work and culture in the post-modern age*. Toronto: OISE Press.

Haught, P.A., Hill, L.A., Walls, R.T., Nardi, A.H. (1998). "Improved learning and study strategies inventory (LASSI) and Academic Performance: The Impact of Feedback on Freshmen". *Journal of the First Year Experience and Students in Transition, 10*(2), 25-40.

Herman, J., & Golan, S. (1990). E*ffects of standardized testing on teachers and learning--Another look.* Los Angeles: Center for Research on Evaluation, Standards, and Student Testing.

Herman, J. (1992). *What's happening with educational assessment?* Synopsis of two presentations delivered at the Annual Meeting of the South Eastern Regional Vision for Education, Tampa, Florida.

Hoffman, J. (1999). "On the mark: Is standardized testing good for education?" *Today's Parent, 16*(10), 76-78.

Hogan, T.P. (1992). *Prospects and problems for a national test: some reflections of a test author.* Paper presented at the Annual Meeting of the National Council on Measurement in Education, San Francisco.

Houle, C. (1980). *Continuing learning in the professions*. San Francisco: Josey-Bass.

Householtzer, I., & Schrock, G. (1997). I*mproving higher order thinking skills of students.* Master's Action Research Project, Saint Xavier University and IRI/Skylight.

Johnson, J.H. (1997). Data Driven School Improvement. *ERIC Digest # 109*.

Knill-Griesser, H. (2000). Action research: Attitude is the key to success. *Ontario Action Researcher: Vol 3*, II. http://www.unipissing,ca/oar

Knowles, M. (1973). *The adult learner: Neglected species.* Houston: Gulf.

Kolb, D. (1984). *Experiential learning*. Englewood Cliffs, New Jersey: Prentice Hall.

Koretz, D.M. (1991). "The effects of high-stakes testing on achievement: Preliminary findings about generalization across tests". Paper presented at the Annual Meetings of the American Educational Research Association, Chicago, Illinois.

Lee, D. and others. (1991). T*he effects of feedback and second try in computer-assisted instruction for rule-learning task.* In Proceedings of Selected Research Presentations at the Annual Convention of the Association for Educational Communications and Technology, Florida.

Linn, R.L. (2000). "Assessments and accountability". *Educational Researcher, 29*(2), 4-16.

Livingston, C. (Ed.). (1992). *Teachers as leaders: Evolving roles.* Westhaven: NEA Professional Library.

MacClure, M. (1996) "Telling Transitions: Boundary work in narratives of becoming an action researcher." *British Educational Research Journal, 22*(3), 283.

McNiff, J. (1988). *Action research: Principles and practice.* London: Routledge.

McNiff, J. (2000). Action research in organizations. London: Routledge.

McNiff, J., McNamara, G. & Diarmuid, L. Eds. (2000). *Action research in Ireland*. Dorset: September Books.

McNiff, J., Lomax, P. & Whitehead, J. (1996). *You and your action research project*. London: Routledge.

Mehrens, W.A. (1998). "Consequences of assessment: What is the evidence?" *Educational Policy Analysis. 6(*13).

Michigan State Board of Education. (1990). *School effectiveness: Eight variables that make a difference.* Lansing.

Mitchell, C. & Weber, S. (1999). *Reinventing ourselves as teachers: Beyond nostalgia.* London: Falmer.

Murphy, J. (1999). T*he quest for a center: Notes on the state of the profession of educational leadership.* Invited Lecture at the Annual Meeting of AERA, in Montreal, Canada.

Naffziger, S.C., Steele, M.M., Varner, B.O. (1998). *Academic growth: Strategies to improve student engagement in their learning.* Master's Action Research Project, Saint Xavier University and IRI/Skylight.

National Center for Fair and Open Testing. (1992). *K-12 testing fact sheet.* Cambridge: Fair Test.

Newmann, F. And Wehlage, G. (1995). *Successful school restructuring*. Maddison, WI: University of Wisconsin.

Nichols, B.W. and Singer, K.P. (2000). "Developing data mentors". *Educational Leadership. 57*(5), 34-37.

Popham, W. J. (1999). "Why standardized tests don't measure educational quality". *Educational Leadership, 56*(6).

Raham, H. (1999). "Linking assessment and school success". *Education Canada, 39*(3), 23,43.

Renyi, J. (1996). *Teachers take charge of their learning. Transforming professional development for student success.* Washington: National Foundation for the Improvement of Education.

Roberts, J. & Dungan, S. (1993). *Tabula Rasa: Case studies of teacher voice.* Paper presented at the Annual Meeting of the American Educational Research Association, Atlanta.

Russell, T. & Korthagen, F. Eds. (1995). *Teachers who teach teachers: Reflections on teacher education.* London: Falmer.

Sagor, R. (2000). *Guiding school improvement with action research.* Alexandria: ASCD.

Schon, D. (1983). *The reflective practitioner: How professionals think in action*. New York: Basic Books.

Schon, D. (1995). Knowing-In-Action: The new scholarship requires a new epistemology. *Change 27* (6) (27-34).

Senge, P.M. (1990). *The fifth discipline: The art and practice of the learning organization.* New York: Doubleday Currency.

Shepard, L.A., & Dougherty, K.C. (1991). *Effects of high stakes testing on instruction*. Paper presented at the Annual Meetings of the American Educational Research Association, Chicago, Illinois.

Shepard, L.A. (1992). "Why we need better assessments". In Kay Burke (ed.), *Authentic Assessment.*(pp. 37-51). Arlington Heights, Illinois: Skylight Professional Development.

Shepard, L.A, and others. (1995). *Effects of introducing classroom performance assessments on student learning.* Paper presented at the Annual Meeting of the American Educational Research Association, New Orleans.

Stiggins, R. (1993). *Alternative assessment strategies for teachers*. Workshop delivered at the International Conference on Evaluation (I.C.E.) Assessing Our Children's Future on Tuesday, Nov. 11, in Toronto: Sheraton Centre.

Sutton, R. (1995). *Assessment for learning*. Salforth: John Roberts.

Sutton, R. (1997). *The learning school.* Salford, England: RS Publications.

Sutton, R. (2000). Workshops on assessment delivered in Brantford, Ontario, Feb. 17 and in North Bay, Ontario, Feb. 28.

The Teachers Network. (1994). *How teachers are changing schools.* New York: The Teachers Network.

Thomas, A., et.al. (1980). *Learning in organizations.* Toronto, Ontario: Department of Adult Education, OISE.

Thurman, R., & Wolfe, K. (1999). *Improving academic achievement of underachieving students in a heterogeneous classroom.* Master's Action Research Project, Saint Xavier University and IRI/Skylight.

Tough, A. (1971). *The adult's learning projects.* Toronto, Ontario: Institute for Studies in Education.

Whitehead, J. (1989). Creating a living educational theory from questions of the kind, "How do I improve my practice?" *Cambridge Journal of Education, Vol. 19*, # 1.

Whitehead, J. (1993). *The growth of education knowledge: Creating your own living educational theory.* Bournemouth: Hyde.

Whitehead, J. (1998). *Educational action researchers creating their own living educational theories.* Paper presented at the Annual Meeting of the American Educational Research Association, San Diego.

Whitehead, J. (1999). *My discipline of education*. Ph.D Thesis, University of Bath. In the living theory section of http://www.actionresearch.net

Wideman, R. (1992). Change as a process of informal investigation: A study of secondary school teachers. *Research Forum*, (November).

Wideman, R. (1995). Understanding how change is experienced: Studies in teacher change. *Orbit, 26*(3).

Wideen, M.F., O'Shea, T., Pye, I., Ivany, G. (1997). High stakes testing and the teaching of science. *Canadian Journal of Education, 22*(4), 428-444.

Wiggins, G. (1998). *Educative assessment.* San Francisco: Jossey-Bass Publishers.

Winter, R. (1998). "Finding a voice-thinking with others: A conception of action research". *Educational Action Research.* 6(1), 53-68.

APPENDIX A

Participant Information Letter

May, 2003

AN ACTION RESEARCH APPROACH TO IMPROVING STUDENT LEARNING

USING PROVINCIAL TEST RESULTS

OUTLINE OF THE PROJECT

Date:

To: Teachers of Grades 3, 4, 6, 7

Thank you for your interest in this research study on the use of action research and the feedback/corrective action strategy to improve student learning in relation to provincial test results. We are inviting you to join us in this investigation and wish to outline the activities involved and the potential time/effort commitment.

The research study will be conducted in the Grand Erie District School Board and the Nipissing-Parry Sound Catholic District School Board in association with Nipissing University.

Five teams of two teachers from this school board will participate in the study. Participants' identities will be protected in the final report through the use of pseudonyms. During the course of the current school year, we would like to involve you in a number of activities that will help both you and us:

1. Investigate action research (McNiff, Lomax, & Whitehead, 1996) as a means to enable teachers to use provincial testing results to improve their practice
2. Investigate the feedback/corrective action strategy (Sutton, 1995, 1997) as a means to improve student learning
3. Investigate factors that help and hinder teachers' use of action research and feedback/corrective action.

There will be two types of meetings – group and individual. Group meetings will be conducted approximately monthly. In the group meetings each team of two teachers will analyze and act upon the results of provincial testing to improve student learning. The feedback/corrective action strategy will be taught and ongoing support for action research will be provided. These meetings will be audio taped. The transcripts from the tapes will be used as research data.

Individual meetings will be conducted no more than twice during the project. The individual meetings will take the form of one-to-one conversations with a researcher. Each conversation will be about *45* minutes in length. These meetings will be audio taped. The transcripts from the tapes will be used as research data.

As part of the research you will be recording and sharing your action research in the following ways:
- reflective journal entries focusing on your action research
- a final report on your action research.

As you can see, there is some commitment of time and effort in this project. We believe that there will be many benefits to you as a result of your participation in this study. If you are interested in participating, please read and sign the attached COMMITMENT TO THE PROJECT AND RELEASE OF INFORMATION FORM.

Thank you for your consideration.

Jackie Delong
Superintend of Schools
Grand Erie District School Board

Kathy Hallett
Superintendent of Education
Nipissing-Parry Sound Catholic District School Board

Ron Wideman
Assistant Professor of Education
Nipissing University

APPENDIX B

Commitment to the Project and Release of Information Form

Fall 1999

AN ACTION RESEARCH APPROACH TO IMPROVING STUDENT LEARNING

USING PROVINCIAL TEST RESULTS

COMMITMENT TO THE PROJECT AND RELEASE OF INFORMATION FORM

I have read the description of the project and have participated in a discussion of the project's intentions, the strategies to be used, and activities in which I will be involved, and the time/effort commitment required. I have also had an opportunity to raise questions and issues regarding the various aspects of the project.

Based on the discussions, and my reading of the distributed information, I understand the following:

1. I will be involved in research that will investigate the use, by teachers, of action research to improve their teaching practice and, specifically, the use of "feedback/corrective action" strategy to improve students' learning.

2. I will be submitting several documents to the researchers including:
   - Reflective journal entries focusing on my action research
   - A final report on my action research project.

I give permission to the researchers to use this information for the purposes of this research only. I understand that all information contained will be kept in the strictest confidence and will not be shared with anyone without my express written permission.

Signed:_____ Date: _____

3. I will be involved in regularly scheduled (generally monthly) meetings with other project participants. In addition there will be a maximum of two individual meeting throughout the project. The meetings will be audio taped and the transcriptions used as data for this project.

I give permission to the researchers to the transcripts from the individual and group meetings for the purposes of this research only. I understand that all information contained will be kept in the strictest confidence and will not be shared with anyone without my express written permission.

Signed:_____ Date:_____

I understand that I am making a considerable commitment of time and effort to the project and do so willingly. At the same time, If I find this commitment onerous as the year progresses, I understand that I may withdraw without prejudice or penalty.

Signed:_____Date:_____

APPENDIX C

Commitment to the Project and Release of Information Form

September 2000

September 2000

AN ACTION RESEARCH APPROACH TO IMPROVING STUDENT LEARNING USING PROVINCIAL TEST RESULTS

COMMITMENT TO THE PROJECT AND RELEASE OF INFORMATION FORM

I give permission for the researchers to include my name in the final research report:

- as a credit at the beginning of the report
- attached to the summary of my action research report, and
- attached to selected quotations of mine in the various chapters

I will be given the opportunity to review the draft to see how and where my name is used and to resolve any concerns I may have had about the use of my name.

I understand that there may be benefits and drawbacks to having my name included. Some of these are identified below:

Benefits:

- I will receive due credit for the action research that I conducted.
- My own voice will be part of the report.

Drawbacks

- I may receive communications from people who have read the report and are interested in learning more.

I understand that, if I do not give my permission, there will be no negative implications for me in terms of prejudice or penalty.

NAME:(Please print) _____

Signed:_____ Date: _____

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APPENDIX D

Questionnaire May/June 2000

Action Research Project
Questionnaire May/June 2000

Participant Code Number _____

Impact of Participation (use back of page if necessary)

1. What has involvement in this project done for you?

2. What are the three key things you have learned about:

- improving student learning

- improving your own practice

- provincial testing

1. To what extent has this action research process helped you clarify and examine the values you hold about teaching and learning. Provide an example if possible.

Helps and Hindrances (use back of page if necessary)

2. What did the facilitators in this project do that helped you?

3. What did the facilitators do that hindered you?

4. If we did this project again with other teachers what should we do differently?

5. What helped you in your school?

6. What hindered you in your school?

7. What could your school do to be more helpful?

8. What could the school board/province do to be more helpful?

Future Actions (use back of page if necessary)

9. Will you continue to use feedback/corrective action? Why or why not?

10. Will you continue to use action research? Why or why not?

11. Will you continue to analyze provincial test results? Why or why not?