

**Implementation of the Wireless Writing
Program: Phase 3. 2003-2004**

**Prepared for:
Peace River North (SD 60)**

by:

**Dr. Sharon Jeroski
Research Director
Horizon Research & Evaluation Inc**

October 2004

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Highlights

In September 2003, Peace River North (SD 60), implemented the Wireless Writing Program (WWP), providing iBooks on a 1:1 basis to all grades 6 and 7 students. Implementation involved 1150 students, and 37 teachers in 17 schools, and followed a successful 18-month pilot project. The Wireless Writing Program (WWP) is designed to improve student achievement, motivation, and learning skills, through the integration of technology with writing instruction. The BC Performance Standards for Writing are an integral part of the program.

Survey and achievement data were collected in both October and June; a random sample of student writing was selected for intensive analysis of changes from September to June; results of provincial writing and reading assessment in May were also analyzed.

Achievement results:

- Student writing achievement improved over the school year. District assessment indicated that the improvement was similar to what would normally be expected at this grade level.
- Provincial testing results were much stronger for grade 7 students in May 2004 (all of whom participated in WWP), than for grade 7 students in May 2003 (where only a few had participated in WWP.) Grade 7 boys and Aboriginal students showed particularly strong improvement, and the gap between male and female students narrowed. Peace River North students equaled provincial performance, as they had in May 2003.
- Students whose teachers had previously participated in the WWP improved dramatically on the district assessment, at almost twice the rate of those students whose teachers were in their first year of implementation.
- On district assessments, the level and rate of change was similar for grade 6 and grade 7, and for both girls and boys. The achievement of girls was substantially higher in both October and June.
- There were striking variations by school and teacher.

Survey results:

- Most students, teachers, administrators, and parents are enthusiastic about participating in the WWP, and believe that the program has had a positive impact on student achievement, attitude toward writing, and learning skills, such as organization.
- Two teachers and 5-10% of parents are extremely negative about the program, and see little benefit in students having iBooks in grades 6 and 7, although they support use of iBooks in high school.
- A survey of student attitudes to writing, administered in both September and June, indicated that students began the year with extremely positive attitudes which they sustained.
- Student use of editing skills varied substantially from one school to another. As with writing achievement, the most positive results and greatest changes occurred in the classrooms of teachers who had previous experience integrating technology through the WWP.

1. Background

In September, 2003, Peace River North (SD 60), implemented the Wireless Writing Program (WWP), providing iBooks on a 1:1 basis to all grades 6 and 7 students. Implementation involved 1150 students, and 37 teachers in 17 schools, and followed a successful 18-month pilot project.

The Wireless Writing Program (WWP) is designed to improve student achievement, motivation, and learning skills (e.g., organization), with a primary focus on writing achievement. Use of the BC Performance Standards for Writing for descriptive feedback and student self-assessment is an integral part of the program. Implementation of the WWP included regular in-service sessions for teachers where they explored the integration of technology with writing instruction, and participated in action research. Mentor teachers—teachers who had participated in the pilot phases of the WWP—provided in-class support to their colleagues, on request.

Survey and achievement data were collected in both October and June; a random sample of student writing was selected for intensive analysis of changes over time. Provincial test data from the Foundations Skills Assessment (FSA) of writing and reading at grade 7 were also analyzed.

2. Writing Achievement

Results in this section are based on four assessments of student writing:

- District assessment of a random sample of impromptu writing from October and June
- District assessment of impromptu writing from all students in the Wireless Writing Program in June 2003
- Teacher judgment of student overall writing achievement level in June 2004.
- Provincial Foundation Skills Assessment of Grade 7 writing in May 2004.

2.1 Highlights

District Assessment

- Student writing improved between October and June. According to district assessment data, this improvement was approximately what might be expected without wireless technology.
- Gains were much greater—nearly double— in classrooms with teachers who were experienced in using wireless technology 1:1. In these classrooms, gains were substantially greater than what might normally be expected. This results suggests that, first, there is, as expected, an ‘implementation bump’ as new processes are introduced, and, second, that instruction and learning are affected in complex ways, as teachers become comfortable with the technology.
- On the district assessment, both girls and boys made similar gains. Girls began and ended the year with greater writing proficiency.
- According to teachers, almost all students met or exceeded expectations in June 2004, except those on IEPs.
- There are substantial variations and inconsistencies in teacher assessment, both of individual pieces of writing, and of overall student progress.

Provincial Assessment (FSA)

- According to provincial assessment data, grade 7 student writing in Peace River North improved substantially from May 2003 to May 2004, with 14% more students meeting expectations in 2004. These results should be viewed with cautious optimism, as

results were similar for the province, where 11% more students met expectations in 2004 than in 2003.

- Peace River North student performance is equal to the provincial performance overall, and for male and female students considered separately. Aboriginal students in Peace River North, for the first time, appear to have performed better in writing than the rest of the province.
- Results varied considerably from one school to another. Generally, FSA results were comparable to results of the district assessment of grade 6 and 7 students; however, there were some anomalies. In a few cases, participation rates vary so greatly from one school to another that it is difficult to make comparisons.

2.2 Data Sources

Student writing achievement was assessed in a variety of ways. The following data are reported here. Note that in all cases, only matched data were considered—i.e., if a student did not participate in all three phases of the writing assessment, he or she was not included in the comparative analysis.

2.2.1 Validation sample.

Approximately 100 student papers (approximately 3 per classroom) were randomly selected as a validation sample. These papers were independently rated by at least three teachers in both October and June. Teachers were unaware of which papers were in this sample. This analysis is the most rigorous and dependable in terms of scoring, and of October-June comparisons. See Table C.1 for detailed results.

2.2.2 Teacher judgment.

- In October, individual teachers scored an impromptu piece of writing for each student in their classes, then submitted the papers and results to the central data base. The impromptu writing was all on the same topic (heroes) and administered using standard instructions (modeled on FSA.) See Tables C.2, C.3
- In June, teachers submitted an overall judgment about the level of writing achievement each of their students had attained, in terms of the performance standards. For this assessment, they considered all of the students' writing, not just one particular sample. See Tables C.2, C.3.

2.2.3 District assessment.

- In June, all grades 6 and 7 students completed an impromptu writing sample, administered according to standard instructions, and on the same topic (how they would distribute one million dollars to three or fewer people/causes.) This writing was scored at a district marking session, with extensive training and calibration. Each piece of writing was scored by two independent raters. See Table C.2, C.3, C4.

2.2.4 FSA.

- In May, grade 7 students participated in the provincial Foundation Skills Assessment, which includes a writing assessment. District and school results are provided for all students, as well as for subgroups including male, female and Aboriginal students. These data allow for comparisons over time, and to provincial achievement levels. See Tables C.5 and C.6.

2.3 Considerations in analyzing writing achievement

Each of these assessments contributed important information. The following points are important in considering the results:

- There were marked inconsistencies in individual teacher scoring of the October 2003 impromptu writing. In some cases, scores were atypically high or low. Scores were considered in the light of previous assessments (e.g., FSA), district records, and consistency across classrooms.

Classes with atypical October scores were eliminated from the comparative data analysis. This resulted in a reduction of the matched sample from 513 to 393.

- The most valid comparisons are those from within the validation sample: here, teacher scoring was carefully monitored, with extensive training and calibration; further, the two samples were collected under similar conditions.

The most valid estimates of change are based on the validation sample.

- There is some justification in comparing teacher-generated pretest scores for impromptu writing with teacher-generated scores for overall achievement in June. In both cases, individual teachers combined their experience with the performance standards to make an estimate of student achievement. However, the June scores are based on a range of writing performance, including carefully crafted and edited work. These probably give the most valid estimate of student overall writing achievement. Classes with atypical results for October were eliminated from this analysis.

Comparisons of individual teacher ratings of October 2003 impromptu writing with June 2004 overall writing achievement have some utility. However, they likely overestimate the amount of change, as comprehensive assessments typically result in higher scores than one-shot impromptu ‘testing’.

The most valid estimates of overall, comprehensive writing achievement in June come from teacher overall ratings. These ratings are able to take into account student performance on a variety of types of writing, and under a variety of conditions.

It is problematic to put too much stock in differences between teachers’ October and June ratings, as these are based on quite different samples of student work.

- Comparisons of October and June impromptu writing, with results for classrooms with atypical scores removed, provide useful information about changes in student achievement, but need to be interpreted with caution, for two primary reasons:
 - The October scores are based on the judgment of only one teacher, without benefit of training or calibration
 - The topics were different; any change in topic is likely to result in a change in scores. Many teachers felt that students responded poorly to the June topic, and

preferred the October topic. However, not all agreed. Some preferred the June topic, and found the October topic problematic. This issue reflects the reality that assessment of writing is not precise.

Comparisons of June and October impromptu writing can provide some evidence of change over time. These comparisons are not as dependable as those involving the validation sample.

- FSA data allow for comparisons of a district overall achievement over time, as well as comparisons to provincial results. Comparisons over time pose some challenges:
 - differences in cohorts (i.e., the grade 7 students of one year are compared with different groups of grade 7 students from other years.)
 - differences in writing topics from one year to another
 - unintended differences in scoring procedures
 - fluctuations in participation rates (i.e., if participation rates go down and achievement goes up, it is difficult to determine if it is a ‘real’ change.)
 - measurement and sampling “error” mean that all results need to be considered within a margin of error; as the number of students involved grows smaller, the margin of error increases. For some schools and subgroups of students it may be so large that valid comparisons are not possible.

Comparisons over time for FSA data are best considered in terms of trends rather than absolute comparisons. Comparisons between a district or school and provincial results tend to be more stable. Participation rates are an important piece of information when considering these data.

2.4 Results

2.4.1 Validated Comparisons: October to June

- Overall, student writing improved between October to June, as measured by the validated impromptu writing scores. On average, student scores in this sample improved by one-half level on the performance standards, and the percent of students meeting expectations increased by approximately 11%. In this sample of 97 students:
 - Average score increased from 2.0 to 2.5 on a 4-point scale
 - Percent meeting or exceeding expectations increased from 85% to 96%
 - Percent at the top half of the scale (fully meeting and exceeding) increased from 14% to 44%.

[See graphs 2.1 and 2.2]

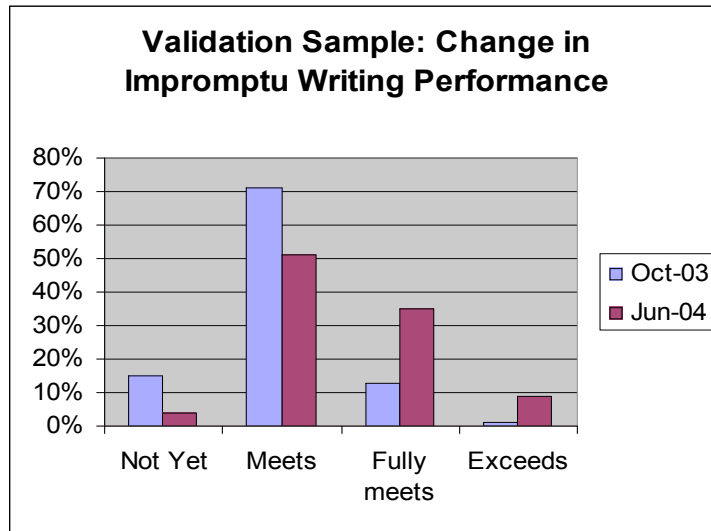
In terms of change, the improvement in student writing is approximately what could be expected over a school year with appropriate instruction.

It is important to note that this sample was drawn for the purpose of detecting change, not establishing overall level of achievement; it appears that students in this sample were somewhat more proficient than the overall population. However, this does not affect the validity of their change scores.

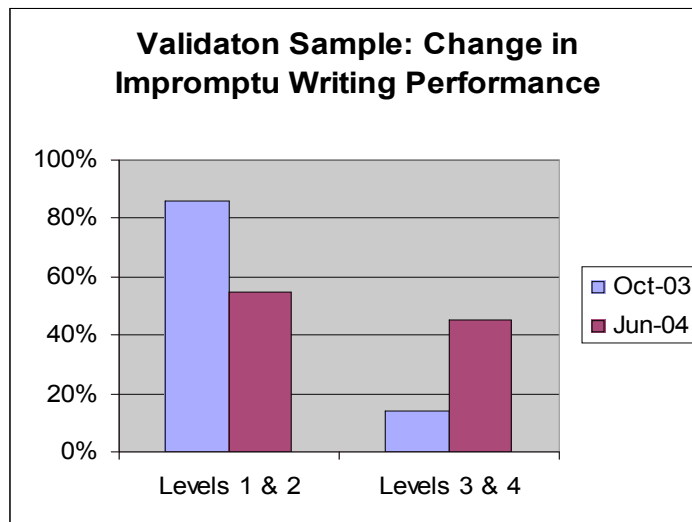
- Students whose teachers had previously participated in Wireless Writing in 2002-2003 showed much stronger gains than those whose teachers were new to project in 2003-2004. For teachers in their second or third years with 1:1 wireless technology, gains were nearly double those of teachers in the first year. For example, in the validation sample, for teachers with previous experience:
 - average score increased by nearly one full performance level (.8 on a 4-point scale)
 - percent meeting or exceeding expectations increased from 81% to 98%
 - percent in the top half of the scale increased from 12% to 60%

[See graphs 2.3 and 2.4]

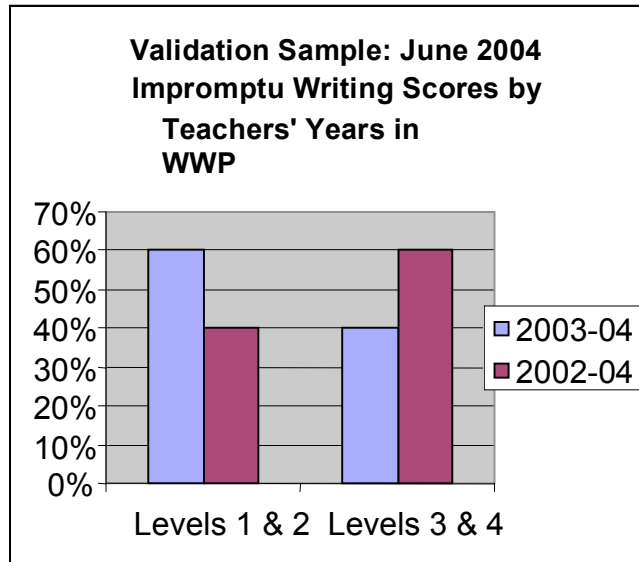
These results are consistent with those reported for 2002-2003; the gain in student performance in these classrooms is comparable. They suggest that student writing improvement grows as teachers become more comfortable with the technology and more experienced in instructional strategies that take advantage of the laptops. Data are based on a relatively small sample; however, they suggest that teachers' prior experience with technology may be more important than students' prior experience, in terms of improving achievement.



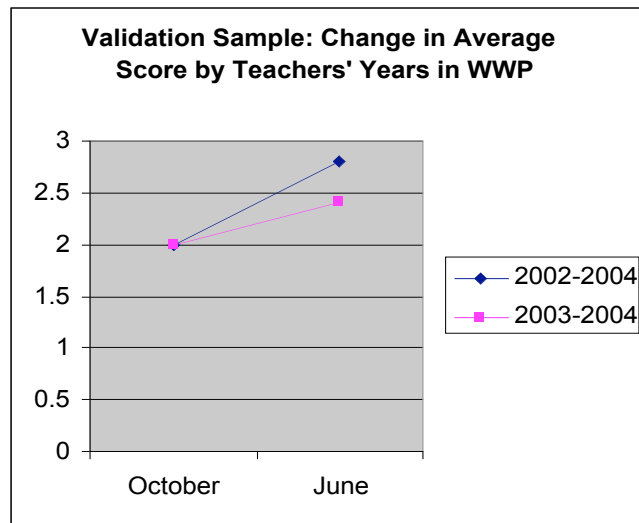
Graph 2.1: Validation Sample: Change in Percent of Students at Each Performance Level: Impromptu Writing



Graph 2.2: Validation Sample: Change in Percent of Students in Bottom and Top Half of the Performance Scale: Impromptu Writing



Graph 2.3: Validation sample: June 2004 Comparison of Percent of Students in Bottom and Top Half of the Performance Scale Top by Teachers' Years in WWP



Graph 2.4: Validation Sample: Change in Average Performance Level (4-point scale) by Teachers' Years in WWP

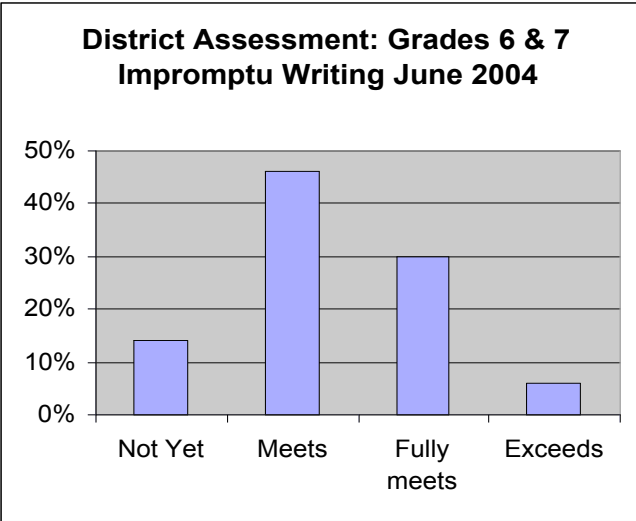
2.4.2 District Assessment: Impromptu writing, June 2004

- In June, all participating students and teachers took part in a district assessment, similar to FSA. Scoring took place in a monitored marking session, using the BC performance standards. Approximately 690 students took part, with the following results:

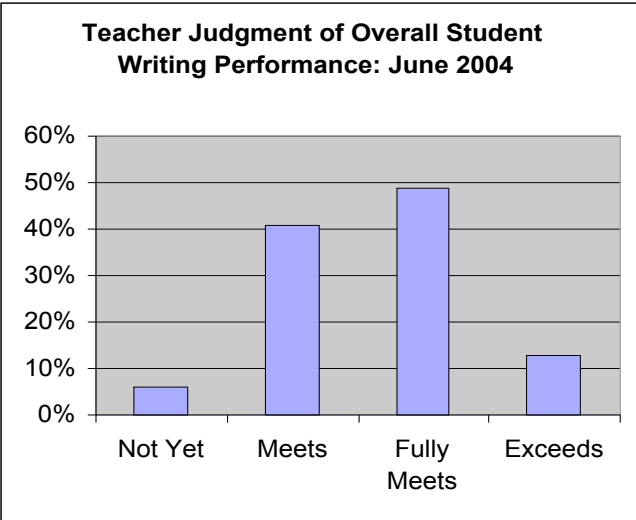
	Not yet	Meets	Fully meets	Exceeds	Mean	sd
Grade 6	10%	52%	33%	5%	2.3	0.7
Grade 7	18%	47%	29%	6%	2.2	0.6
Combined	14%	50%	30%	6%	2.3	0.7

[see Graph 2.5]

- There were marked differences by school, with the percent of students within a school who met or exceeded expectations ranging from 97% to 71%, the percent exceeding expectations ranging from 16% to 0%, and the average score from 2.6 to 1.8 on the four-point scale (close to one full performance level.)
- Results are similar to June 2003 FSA scores, where 77% of grade 7 students met or exceeded expectations, compared with 82% of grade 7 students on this assessment. This difference is not statistically significant. Results are significantly lower than 2004 provincial testing results, where 90% of grade 7 students met or exceeded expectations. (see Section 2.4.4 for a further discussion of 2004 provincial results.)
- When results were analyzed by gender, girls scored significantly higher than boys, in terms of average score (2.5 to 2.1), percent of students meeting or exceeding expectations (92% to 83%), and percent of students scoring in the top half of the scale (46% to 23%.) While a similar percent met or exceeded expectations when compared with June 2003 FSA (92% to 86%—-with margin of error), more boys met expectations on the district assessment than on June 2003 FSA (83% to 66% .) Again, these results should be viewed cautiously for the same reasons as described above.
- While scores from one aspect of writing to another were similar, students consistently received the lowest ratings for *style*, both boys and girls and in both October and June assessments. Ratings for *meaning*, *form*, and *conventions* were slightly higher.



Graph 2.5: All Grades 6 and 7 Students: Percent of Students Attaining Each Performance Level on the District Assessment of Impromptu Writing June 2004



Graph 2.6: Percent of Grades 6 and 7 Students at Each Performance Level: Teacher Judgment of Overall Student Writing Performance, June 2004

2.4.3 Teacher Judgments of Overall Student Writing Performance in June

- Teachers submitted ratings for each student's overall writing achievement. Teachers were instructed to consider all available evidence—portfolios, various writing assignments and activities – in order to determine which level best described student achievement. They were permitted to assign 'half' scores – i.e., between levels. However, when the results were summarized, these were converted to the four levels of the performance standards. *Note: students on IEPs are not included in this analysis.*
- Overall, those teachers who submitted scores judged that 94% of their students were meeting expectations; 53% fell in the top half of the scale; and the average score was 2.6. These are not test scores; they are comprehensive assessments of student performance, and, as such, generally offer a more valid picture of achievement level than can be provided by one test. However, they are subject to some inconsistencies from one teacher to another.

[see Graph 2.6]

- The ratings varied substantially from one teacher and school to another. Typically, the teacher ratings were approximately .3 of a scale point higher than the impromptu writing scores; however, in some instances, the difference was much greater, as high as .9 (nearly a full performance level), and in a few cases, teacher ratings were as much as .4 lower (nearly half a performance level.)
- When overall results were considered, results by school ranged from:
 - 100% meeting or exceeding expectations to a low of 79%
 - 72% of student in the top half of the scale to a low of 20%
 - Average scores from 3.2 to 2.1 (a difference of over one performance level on a four-point scale.)

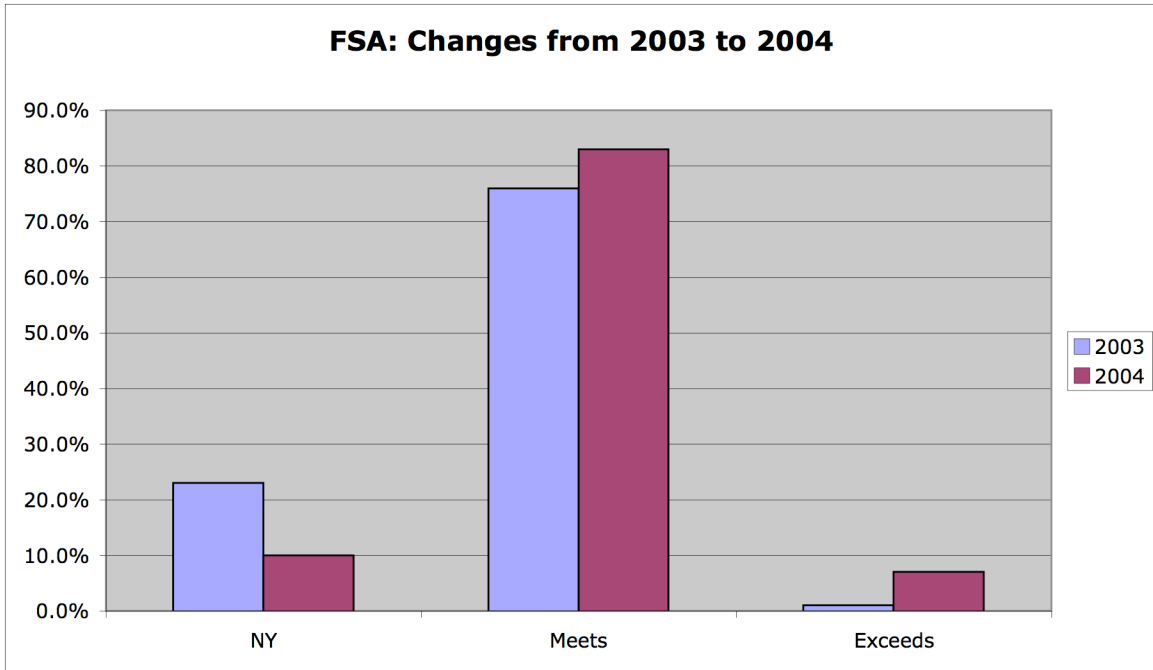
2.4.4 FSA Results: Grade 7 Writing

- District and school FSA results for grade 7 writing indicate high levels of achievement: 90% of students met or exceeded provincial expectations, a result that is equal to the provincial population. In terms of trends, this is a very positive result: while historically, grade 7 student achievement has been below provincial levels, the difference has been smaller with each successive year, and students in Peace River North are now performing at the same level as their counterparts throughout the province. (See Tables C.5 and C.6; graphs 2.7, 2.8 and 2.9)
- This change is consistent across all subgroups: results for male, female and Aboriginal students have all improved, both relative to provincial results and to previous district results. (see Table C.6; Graph 2.8)

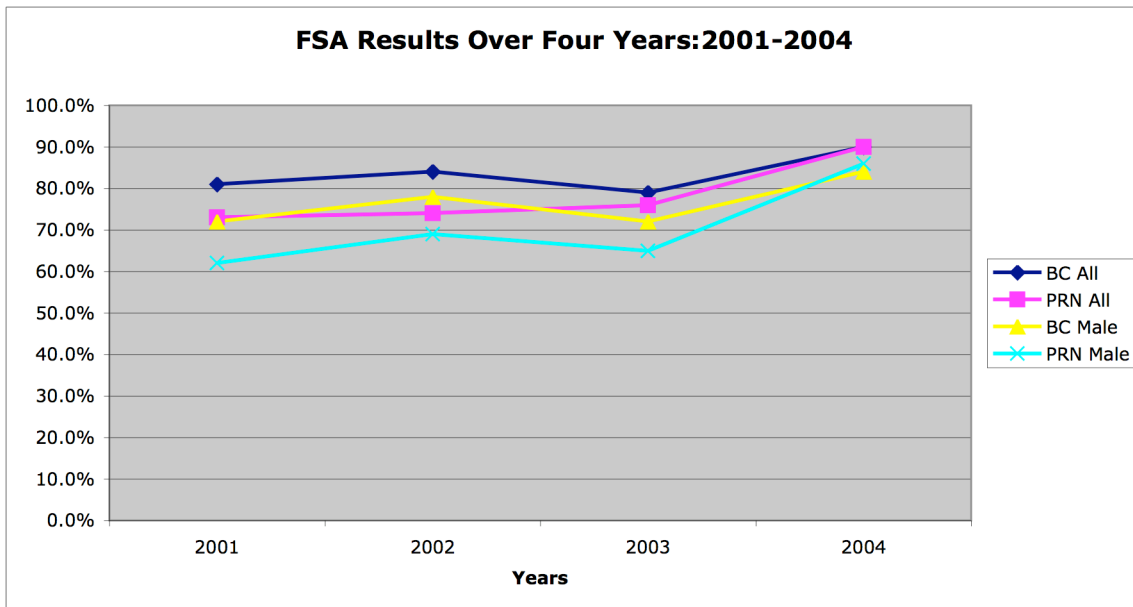
- Overall, 14% more grade 7 students met or exceeded expectations in 2004 than 2003. Performance of all subgroups also increased dramatically: male students from 65% to 86%; female students from 86% to 94%; Aboriginal students from 59% to 85%. Comparisons with previous years should be viewed with caution:
 - Relative to provincial results, both 2003 results and 2004 results for the overall population fall within the margin of error: that is, in both years results from Peace River North are judged to be statistically similar to the province.
 - The fact that provincial results increased by 11% between 2003 and 2004 suggests that there may have been some anomalies in this year's assessment. It is possible that next years could appear to be lower *even if students continue to improve their skills*.
 - Participation rates in Peace River North have gone down: that is, relatively more students were excused or absent from testing in 2004. That makes comparisons difficult to justify. Changes were particularly noticeable in two schools (see Table C.5)

- Results for grade 7 reading also improved both over the previous year, and relative to provincial results. For the first time since 2000, Peace River North reading results approached provincial levels of achievement. This result helps to validate improvement in writing; while reading and writing are different skills, they are closely related, and an improvement in one often contributes to an improvement in the other.

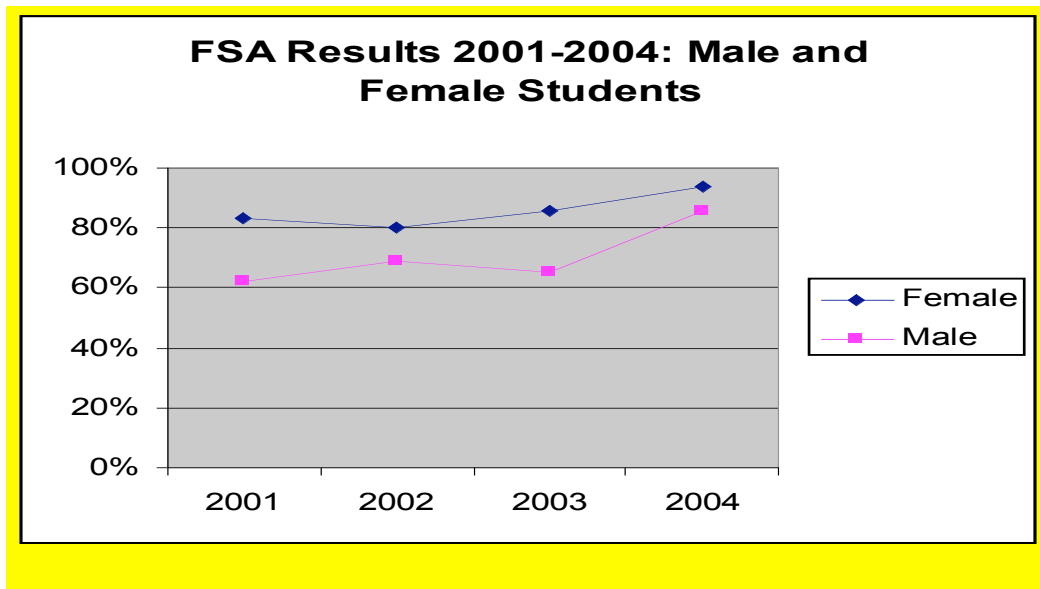
- The gap between FSA writing scores of female students and male students in Peace River has declined substantially since the introduction of the WWP. Typically, the gap between the percent of grade 7 female and male students has been approximately 20%; in 2004, the difference was 8%. (See Graph 2.9) This reduction in the "gender gap" was restricted to grade 7 writing, the focus of the WWP. In reading, and in grade 4 writing, there was no change in this gap.



Graph 2.7: FSA Results: Change in Percent of Peace River North Students Meeting and Exceeding Expectations (May 2003 - May 2004)



Graph 2.8: FSA Results: Change in Percent of Peace River North Students Meeting and Exceeding Expectations for Peace River North Compared with British Columbia



Graph 2.9. FSA Results. Change in Percent of Peace River North Male and Female Students Meeting and Exceeding Expectations 2001-2004.

3. Perceptions: Survey Results and Teacher Feedback

Results reported in this section are based on:

- two teacher surveys conducted in September, 2003 and June, 2004 (n=45, 36)
- teachers' written reflections and action research reports
- an administrator survey completed in June, 2004 (n=17)
- three students surveys conducted in September 2003, May 2004, and June 2004 (n=791, 761, 721)
- parent surveys from June 2004 (345)

Approximately 25% of students, teachers, and schools had participated in the Wireless Writing Project during the 2002-2003 school year, on a least a part-time basis.

Detailed results are provided in Appendices A and B.

3.1 Highlights

3.1.1 Teacher Perceptions

- Most teachers' viewed their participation in the Wireless Writing Program very positively. They tended to choose 'extensively' or 'a great deal' to describe effects of the program, and reported that:
 - They enjoyed having iBooks in their classrooms
 - Their students' writing had improved
 - The iBooks helped students with various aspects of the writing process
 - Using iBooks had changed their teaching practices
- A substantial number were ambivalent, often choosing 'somewhat' to describe changes in their students or their classroom. This group supported the use of the iBooks, now and in the future, but tended to identify gains and benefits to a lesser degree ("somewhat.")
- A small minority (2 teachers) saw the iBooks as unhelpful in terms of improving achievement and motivation, and reported few benefits for their students. They did not see the iBooks as important to students in grade 6/7; however, they did support the use of iBooks in high school.

3.1.2 Administrator Perceptions

- Most administrators also voiced strongly positive opinions about the Wireless Writing Program. In most cases, they chose 'extensively' or 'a great deal' to describe positive impacts on their schools and students. They were more

ambivalent about the effect of iBooks on teaching practices, most often choosing ‘somewhat’ or ‘extensively’ to describe changes in teacher practice.

- A small group (3 of the 17 administrators surveyed) was less enthusiastic about the iBooks and their benefits, often choosing ‘somewhat’ to describe their views. These administrators consistently chose ratings one or two levels lower than their peers. *Note: because the administrator survey was anonymous, it is not possible to determine whether these administrators are at the same school as the two teachers described above.*

3.1.3 Student Perceptions

- Most of the over 700 students who responded to a survey in June reported that they liked using iBooks. They believed that the iBooks had helped them to improve all aspects of their writing, as well their technology skills, their organizational skills and their attitudes. They strongly endorsed the use of iBooks for themselves and for other grade 6 and 7 students.
- Responses were remarkably similar from one school to another, regardless of how long the school had been part of the WWP. There were, however, a couple of notable exceptions: students at one school were significantly less positive than their peers. One teacher at that school was also very negative about the WWP. It is not possible to conclude, with any certainty, whether the teacher’s negative perceptions affected students’ perceptions and attitudes, or vice versa. However, the differences between students in this school and others are startling.

3.1.4 Parent Perceptions

- Most of the 345 parents who responded to a survey in June voiced positive views of the WWP, most often choosing ‘extensively’ or ‘a great deal’ to describe their opinions. Most parents strongly supported their own children and other grades 6/7 and high school students using iBooks. They saw gains in their children’s technology and writing skills, as well as in their confidence, attitude, motivation, and organizational skills.
- These positive views were not unanimous. Between 5-10% of parents reported that they saw no benefit and did not support use of iBooks; a further 10-15% offered ‘little’ support and saw ‘little’ benefit. There were marked differences among schools.

3.2 Overall response

3.2.1 Teachers

- In September, over 75% of teachers reported that they were enthusiastic about participating in the WWP. In June, 84% of teachers expressed similar levels of enthusiasm. These data are supported by teachers' written reflections. While teachers described many challenges, most indicated that they liked having iBooks in their rooms 'extensively' or 'a great deal' (84%), and that it was important for schools to provide iBooks in grades 6/7 (61%). They also strongly endorsed the use of the iBooks in high school (89%).
- In September, only one teacher expressed strong reservations about participating in the WWP. In June, two teachers chose relatively negative responses ("not at all" and "a little.")

3.2.2 Administrators

- In June, 2004, all administrators reported that they liked having iBooks in their schools at least 'somewhat.' The largest proportion (14 of 17, or 82%) chose 'extensively' or 'a great deal' (the top two scale-points on a 5-point scale.) The same number strongly endorsed having iBooks in their schools for 2004-2005. Most gave a high rating to the importance of providing iBooks in grades 6-7 (11/17, or 65%, chose 'extensively' or 'a great deal.')
- Three administrators (18%) were less positive, choosing 'somewhat' to describe their own response to iBooks in their schools; one of these assigned little importance to continuing to have iBooks in his/her school for the coming school year, and two of these (12%) chose 'a little' to describe the importance of iBooks in grades 6-7.
- Administrators were evenly split about the level of challenge that implementing iBooks had presented in their schools: 9/17 chose 'extensively' or 'a great deal' while 8/17 reported 'somewhat' or 'a little.'
- All administrators reported that parents had reacted at least 'somewhat' positively to the iBooks; 12/17 (65%) indicated that parents supported the program 'extensively' or 'a great deal.' Most administrators did not see a great deal of change in how parents participated and collaborated in their children's work (10/17 chose 'somewhat.')

3.2.3 Students

- Students like using iBooks, believe that the iBooks have made a positive contribution to their education, and want all students to have similar opportunities. Over 85% of students reported that they liked having iBooks “quite a bit” or “a lot.” When data from individual schools was considered, this figure ranged from 65% to 100%. Students reported that the iBooks were important to their success in school (73%) and indicated that it was important for them to have iBooks in the next school year (71%). They were even more supportive of others having iBooks in grades 6 and 7 (78%) and in high school (74%.)
- Less than 5% of students saw no benefits to the iBooks.
- Generally, students perceived their iBooks as reliable: over one-third chose the highest scale point (“a lot”) to describe how dependable their iBooks had been; a further 50% described the iBooks as working well ‘quite a bit.’ A small number (3%) reported that their iBooks had not been at all reliable.
- While students in June 2004 reported that the iBooks had changed their attitudes toward writing, comparison of an attitude survey administered in both September and June indicated that most grade 6 and 7 students had positive attitudes toward writing in September; these were maintained, but did not increase, during the school year. *Note: approximately 25% of these students had participated at least part time in the program during the previous year.*
- There were variations in reported attitude change among individual schools; generally, the pattern was similar to other results. However, because of the relatively small number of students at any one school, the differences were not statistically significant.

3.2.4 Parents

- Most parents like their children having iBooks; nearly two-thirds (64%) chose ‘extensively’ or ‘a great deal;’ a further 23% chose ‘somewhat.’ Only 13% chose ‘not at all’ or ‘a little.’ This pattern of responses was repeated for questions about the importance of schools providing iBooks in grades 6/7 and the importance that iBooks be available to other children in the family, where close to 60% chose ‘extensively’ or ‘a great deal.’ Over 85% of parents indicated some support for students using iBooks in high school; over 70% chose ‘extensively’ or ‘a great deal.’
- A consistent minority of parents reported little support for the use of iBooks by their own children or others: when asked how much they liked their own children having iBooks, 13% chose ‘not at all’ or ‘a little,’ and provided a similar response to the use of iBooks in high school. Approximately 20% indicated a belief that it was not important to provide iBooks in grades 6/7, or for other children in their families.

- When responses were broken down by individual school, the percent of parents who strongly supported the use of iBooks for their own and other grade 6/7 students varied from 34% to 88%, with between 60-80% of parents at most schools expressing strong support ('extensively' or 'a great deal.'). The range of endorsement for using iBooks in high school was even greater, 32% to 92%. While several schools had one or two parents reporting negative views, the most consistent and greatest negative response came from one community. Overall, parents at seven schools expressed relatively strong support; at three schools, support was moderate; and at one school, very weak.

3.3 Student writing achievement

3.3.1 Teachers

- The largest group of teachers (47%) reported that student writing achievement had improved "somewhat" and that the iBooks had contributed "somewhat" (3 on a 5-point scale.) A similar proportion (45%) saw stronger gains ("extensive" or "a great deal"); a small group (8%) saw little or no benefits.
- When asked about specific aspects of writing:
 - Over 90% of teachers reported that the iBooks had helped students 'extensively' or 'a great deal' with: accessing information; developing technology skills; and presenting their work.
 - Between 80-89% said iBooks had helped students with drafting, editing and revising.
 - Between 70-79% said iBooks had helped with quantity of writing and benefited high achieving students.
 - Between 60-69% indicated that the iBooks had helped students improve the organization of their written pieces; between 50-59% said that iBooks had helped students 'extensively' or 'a great deal' in terms of conventions, and had helped low achieving students.
 - Between 40-50% indicated that iBooks had helped students: plan their writing; understand information; improve 'meaning' and style in their writing; and had been helpful to First Nations students.
 - Again, a small minority (3-5% or 2 teachers) consistently chose 'not at all' or 'a little' to describe the impact of iBooks.
- Teachers perceived the writing of their students in 2003-2004 to be somewhat better than that of the students they taught in 2002-2003. Survey results indicate

that teachers believe most of the shift has been from low ratings to mid-ratings; the high ratings have not changed.

- Low ratings (“never” or “once in while”): 2003: 24%; 2004: 5%
 - Mid-point ratings (“sometimes”): 2003: 43%; 2004: 67%
 - High ratings (“often” “most of the time”) 2003: 33%; 2004: 38%
- Teachers perceived the iBooks as benefiting both girls (72%) and boys (78%).

3.3.2 Administrators

- Administrators were even more positive than teachers that student achievement had been positively changed through use of the iBooks. All 17 administrators described student writing as improving at least ‘somewhat’; 12 (71%) believed students had improved ‘extensively’ or ‘a great deal.’
- All but one administrator (16/17 or 94%) saw strong improvements in students’ technology skills.
- Administrators saw equal benefits for both girls and boys (14/17 or 82% choosing the top two ratings.) A similar number saw strong benefits for high-achieving students and low-achieving students. A slightly smaller number (13/17) saw strong benefits for First Nations students.

3.3.3 Students

- Over 80% of students reported that their writing had improved ‘quite a bit’ or ‘a lot.’ For individual schools, this ranged from 57% to 100.% Students were most likely to cite improvements in: organization (75%); style (71%); and meaning (70%); slightly less likely to report changes in conventions (66%).
- When asked about various aspects of the writing and researching process, students saw their laptops as most useful for:
 - Finding information (92%)
 - Editing and revising (85%)
 - Keeping work and assignments organized (85%).

They also saw ‘quite a bit’ or ‘a lot’ of benefits in:

- Planning (65%)
- Drafting (76%)

3.3.4 Parents

- Most parents who responded to the survey believe that using an iBook has helped their child at school. Over 80% described the iBooks as helping at least ‘somewhat’ in improving both written expression and overall school work; over 50% described the role of iBooks as ‘extensively’ or ‘a great deal.’ Again, there were dramatic variations by school, with the level of strong agreement ranging from 26% to 74%
- Over 96% of parents saw improvements in their children’s computer skills; 86% described these as ‘extensive’ or ‘a great deal.’
- Over 70% of parents also saw strong improvement in their child’s ability to present their work effectively; a further 21% saw some improvement.

3.4 Student motivation

3.4.1 Teachers

- Generally, two-thirds of teachers saw more positive attitudes toward writing, along with improved motivation, organization, and responsibility in students who participated in the WWP.
- Teachers believe that the students who used iBooks in 2003-2004 are much more positive about writing than the students they taught in 2002-2003. In June, they indicated that 67%, or two-thirds of their students enjoy writing ‘often’ or ‘most of the time.’ In September, when asked to reflect on their students from the previous year, 35% said they enjoyed writing ‘often’ or ‘most of the time.’
- Between 60-69% indicated that iBooks had contributed ‘extensively’ or ‘a great deal’ in helping students organize and keep track of their work; work productively (on-task); take responsibility for their own work. A similar proportion indicated that iBooks had been helpful to students with attention problems. Between 50-59% said that iBooks had been helpful for students with weak organizational skills and students with motivation problems.

3.4.2 Administrators

- Most administrators saw strongly positive effects on student engagement, attitude, motivation, and confidence. Over 70% (12/17 to 14/17 depending on the specific

question), reported that the iBooks had contributed ‘extensively’ or ‘a great deal’ to student change in these areas.

- Most administrators also saw the iBooks as helping students with attention problems (13/17 chose ‘extensively’ or ‘a great deal’) and those with weak organizational skills (10/17.)
- Most administrators did not see the iBooks as having a major impact on schools climate and community (11/17 chose ‘somewhat.’)

3.4.3 Students

- In June, over 70% of students reported that their attitude toward writing had improved ‘quite a bit’ or ‘a lot’; 53% reported similar improvement in their overall attitude toward school. However, a comparison of a separate attitude survey administered in September 2003, and repeated in May 2004, indicated that, while student attitudes were very positive, they had not changed significantly over the school year: in both September and June, over 80% reported that they liked writing at least “sometimes” and close to half reported that they liked writing “often” or “most of the time.”

3.4.4 Parents

- When asked about children’s attitude and motivation, organization, and confidence, over 50% of parents felt the iBooks had contributed to change or improvement, ‘extensively’ or ‘a great deal’; approximately 25% chose ‘somewhat.’ There were extreme variations among schools, with only 16% of parents from one school perceiving the iBooks as strongly improving their children’s confidence, while at two other schools, close to 80% attributed strong improvement to the iBooks.
- Parents were also asked about the extent to which iBooks had improved their children’s work habits: 41% chose ‘extensively’ or ‘a great deal’; 37% chose somewhat.
- Parents agreed that their children liked having iBooks for school work; over 80% expressed strong agreement. Again, there were some variations among schools, with parents at two schools expressing lower levels of agreement (45% and ? and at two others, very high levels of agreement (89% and 93%).

3.5 Teaching practices and Learning tools

3.5.1 Teachers

- 91% of teachers indicated that their students used iBooks for their writing assignments, including in content areas, often or most of the time. Two teachers said their students use iBooks ‘sometimes’; one teacher reported that students **never** use iBooks for their writing assignments.
- Teachers were asked about the extent to which iBooks had changed their teaching practices. Over 70% indicated strongly that they provide more choice and responsibility to students.
- Slightly more than half reported that they had changed ‘extensively’ or ‘a great deal’ in terms of:
 - Planning lessons and units
 - Designing and marking assignments
 - Organizing the classroom
 - Engaging students in self-assessment
 - Providing feedback to students
 - Managing student activities and behaviour.

In these areas, the remaining teachers were relatively evenly divided between the mid-point (“somewhat”) and the lower scale points (“not at all” and “a little.”) Again, 1-2 teachers consistently reported that the iBooks had not changed their practices at all.

- A number of questions about teachers’ use of technology were asked both in September 2003 and in June 2004:
 - In September, 44% of teachers reported ‘often’ or ‘most of the time’ using computers to plan and prepare, compared with 80% in June.
 - In September, 51% said they were confident about computer technology ‘often’ or ‘most of the time’; this increased to 73% in June. (Note: the remaining 27% said they were ‘sometimes’ confident; none chose ‘not at all’ or ‘once in a while.’)
 - The percent who reported using e-mail to communicate with colleagues increased from 33% to 50%.
- Teachers were also asked about their practices in terms of teaching writing in both September 2003, and June 2004. In most cases, teachers reported similar practices, for example:
 - All teachers reported using a writing process approach at least ‘sometimes.’ In June, over 97% reported using this approach ‘often’ or ‘most of the time.’

- In both September and June, most teachers reported that ‘often’ or ‘most of the time’ they:
 - use the BC Writing Performance Standards (over 80%)
 - integrate writing across the curriculum (over 85%)
 - adjust their instruction based on their assessments (over 88%)
 - give students choice in the topics they write about (over 66%)
 - have students do peer editing (over 60%)
 - share scoring criteria with their students (over 90%)
 - expect students to self-assess their writing (over 60%)
- While responses were positive in both September and June, teachers were somewhat more likely (approximately 10%) to report the following practices: student self-assessment; students know criteria; writing is integrated across the curriculum; students work in pairs or groups when planning.
- Teachers were also asked about some procedures introduced through the WWP:

	Never/once in a while	Sometimes	Often/most of the time
Use iBook to distribute materials	30%	28%	42%
Use drop box to collect work	39%	28%	34%
Use Writing performance Standard templates	25%	28%	47%
Students use vault to store writing	21%	28%	61%
Students choose samples for electronic portfolios	8%	28%	61%

3.5.2 Administrators

- Administrators were asked to indicate the extent to which using iBooks changed the practices of teachers in their schools. Most reported that practices had changed at least ‘somewhat.’ The same administrators who reported relatively negative perceptions of the program overall, also reported few impacts on teacher practice. In terms of specific questions:
 - All administrators saw changes in the ways teachers used the BC Performance Standards; 13/17 (76%) indicated that practices had changed ‘extensively’ or ‘a great deal.’
 - Most administrators were evenly split between choosing ‘somewhat’ and ‘extensively’ to describe changes in the way teachers: design and mark assignments; organize their classrooms; engage students in self-assessment;

provide feedback to students; and provide choice and responsibility to students.

- Most administrators reported that teacher practices had changed ‘somewhat’ in terms of managing student activities and behaviour, and differentiating instruction to provide for individual needs.
- It is interesting to note that, generally, administrators were slightly more likely to perceive changes in teaching practice than were teachers. The one exception was in providing choice and responsibility, where most teachers reported major changes (over 70% of teachers compared with 47% of administrators chose ‘extensively’ or ‘a great deal.’)

3.5.3 Students

- Students were asked to identify how helpful various software applications had been for improving their work.
 - 90% reported that word processing (Word) had been helped ‘quite a bit’ or ‘a lot’; a similar proportion reported benefits of using editing tools (e.g., spellchecker, thesaurus) and the Internet.
 - Over 70% reported similar levels of benefit for PowerPoint.
 - Nearly two-thirds of students indicated that the BC Performance Standards had helped ‘quite a bit’ or ‘a lot.’ However, that number dropped below 50% at three schools.
 - A smaller number reported benefits of using Inspiration (41%) and iMovie or iPhoto (50%). These results were extremely variable from one school to another. Some teachers have not introduced these tools to their classes.
- Students also completed a survey to describe the writing strategies and activities they engaged in. The survey was administered in both September and May, to gauge the extent to which practices had changed:
 - In May, students were somewhat less likely to report making a list, web or outline (30% in September, and 23% in May chose ‘often’ or ‘most of the time’), or getting help from other students (36% to 24%) or their family (46% to 25%).
 - The number of students who reported using the Internet to find information ‘often’, or ‘most of the time’ increased (47% to 59%), and, not surprisingly, using computers to do their writing (56% to 74%). The surprising result was that 10% of students in the WWP who had received iBooks reported that

they used computers ‘never’ or ‘once in a while.’ There were obviously some variations in implementation from one classroom to another.

- Students in both September and May reported frequently editing and revising their first drafts, with over 75% reporting that they ‘sometimes’ made changes; and over 50% reporting that they ‘often’ or ‘most of the time’ tried to improve their first drafts. Over 90% reported that they ‘often’ or ‘most of the time’ fixed mistakes.

The percent of students who reported making changes ‘often’ or ‘most of the time’ increased between September and May in terms of: adding new ideas and information (46% to 64%); changing words or sentences to improve them (60% to 64%); and moving or deleting parts (55% to 60%.) As noted above, an overwhelming number of students reported in both September and May that they fix mistakes; this number increased very slightly (81% to 83%.)

- Analysis of individual school data produced some interesting results. Because of the relatively small number of students at any one school, changes can be due to random error and need to be interpreted with caution. Often, even modest changes (e.g., 10%) are not statistically significant. However, it is possible to draw some conclusions based on patterns of results:
 - Students’ reported use of editing skills and strategies varied substantially from one school to another in both September and May.
 - Students in five schools showed consistent, positive changes in the amount of editing they reported. This group of schools included three of the four schools that participated in WWP in 2002-2003.
 - The pattern for most schools was inconsistent or indicated no change.
 - For one school, the pattern was both substantial and consistently negative. Although there are relatively few students, the magnitude and consistency of the change indicates that students in May do not appear to edit their work as much as they did in September.

3.5.4 Parents

- Parents were asked a series of questions about their children’s use of specific applications and tools, when doing homework or using the iBook for leisure. In parents’ views:
 - Students were most likely to use editing tools (71% ‘extensively’ or ‘a great deal’); word processing (59%); and PowerPoint (47%.)
 - A substantial proportion also frequently use Inspiration (40%), access the Internet (39%) and iPhoto or iMovie (33%.)
 - A smaller proportion frequently use the Performance Standards/Quick Scales at home (29%.)

- In most cases, a further 20-25% of parents described their children as using these tools ‘sometimes.’
- When asked how often they looked at work that their child was doing on the iBook, 34% of parents reported ‘extensively’ or ‘a great deal’; most (39%) said ‘sometimes’; 26% indicated ‘a little’ or ‘not at all.’

4. Conclusions and Recommendations

4.1 Continuation of the WWP

Results of the WWP continue to be promising, especially in terms of improving student achievement. There is strong evidence that an implementation ‘dip’ occurred in classrooms where teachers had little previous experience integrating 1:1 wireless technology. Where teachers were in their second or third year in the program, gains were impressive and nearly double that of their colleagues who were encountering 1:1 technology for the first time. However, even in classrooms where gains were less impressive, students continued to improve their writing achievement at roughly the level that would normally be expected, without technology integration.

There is strong teacher, student, administrator, and parent support for continuing the WWP. Parents and students, especially, would like the program to continue into grades 8-9.

Because gains appear to be associated with teacher confidence and experience with integrating 1:1 technology, it is important that the program be continued so that there are opportunities to benefit from the experiences that teachers have gained. The program should continue to be carefully monitored, and efforts made to confirm whether or not the apparent ‘experience gains’ can be replicated. Results to this point should be regarded as preliminary and tentative; the program was envisioned as part of a 5-year plan. That plan should continue for the full five years.

Recommendations

- Continue the WWP at grades 6 and 7.
- Continue to monitor effects of the WWP.
- Focus increased attention on factors that make some teachers much more successful in improving students achievement and motivation than others (e.g., increased experience and comfort level with technology).
- Explore possibilities for extending the WWP to grades 8-9.

4.2 Instructional Practices and Support

The strong performance of students whose teachers had previously participated in the WWP suggests that teacher attitude, confidence, and experience play a major role in determining the extent to which integrating wireless technology can improve student writing.

Teachers offered a great deal of advice about the type of support they would like in 2004-2005, including: continued opportunities to meet, in order to share and discuss strategies, issues and trouble-shooting; inservice focusing on writing; classroom visits from mentor teachers; and in-classroom tech support. Some teachers were also interested in learning new applications.

Recommendations

- Continue a program of inservice sessions where teachers are able to meet with others at the same grade level. Consider including optional opportunities outside of school hours.
- Provide ongoing classroom support and follow-up from mentor teachers. Create a schedule or system for this support so that teachers can plan accordingly.
- Create a planning team to develop strategies for writing inservice and support. Consider focusing on *style* as this is consistently the weakest area of student writing.
- Continue dedicated technical support.
- Provide optional after school or Saturday sessions on technology applications.
- Ensure that, as new initiatives, programs, and resources are introduced in Peace River North, explicit attention and inservice focuses on how these initiatives can be integrated with the WWP.

4.3 Parent involvement

Most parents are very positive about their children's participation in the WWP. However, there are ongoing issues about insurance and financial responsibility that need to be dealt with.

As the WWP becomes consolidated, the potential of the technology for increasing parent's involvement in their children's learning, and enhancing communication between home and school should be explored.

Recommendations

- Continue to provide evening sessions on topics of interest to parents.
- Establish an interest group of teachers, administrators, district staff, and perhaps students and parents, to explore ways of using the iBooks to increase school-home communication.

4.4 Administrator Involvement and Support

While most administrators were very supportive of the WWP, several described a variety of challenges associated with implementation.

Recommendations

- Establish a consistent way of supporting and communicating with administrators about the WWP, and providing opportunities for them to share strategies and issues.

4.5 New Opportunities for Students

As in any area of learning, there are some students who need additional support, and others who can benefit from additional challenges.

Recommendations

- Develop optional ‘camps’ or programs for students who have developed considerable skills with technology and are interested in learning more about special topics and applications, such as computer animation.
- Continue to work with ESL teachers, and develop further support for learning assistance teachers who work with students in the WWP.

4.6 A note about teacher attitude

Most teachers who were new to the WWP in 2003-2004 were enthusiastic about participating in the WWP. Two teachers, however, expressed very negative perceptions. It is unrealistic to expect that students in these classrooms will benefit from the WWP. In one case, many students and parents reflect the teachers’ negative attitudes; in the other case, they do not.

Situations such as this should not continue; they are unfair to both students and teachers. While these are primarily issues of personnel supervision, and not technology integration, the potential impact on the WWP, on teacher mental health, and on student learning is substantial.

District and school administration need to develop appropriate strategies for dealing with these situations, and others that may arise, which may include offering teachers who do not wish to participate in the WWP opportunities to teach at other grade levels.

Recommendations

- Develop consistent personnel practices and policies regarding teacher and student participation.
- Provide opportunities for teachers who do not wish participate in the WWP to transfer to other grades.