The Use Of Computer Technology For Literacy Intervention: Factors contributing to the use of computer-delivered skills-based literacy software.

John Morgan
Toronto Catholic District School Board
Institute of Child Study, Ontario Institute for Studies in Education, University of Toronto

Nicholas White, Andrew Portal, Marina Vanayan
Toronto Catholic District School Board

Jennifer Lasenby
Ontario Institute for Studies in Education, University of Toronto

Abstract

Secondary school staff in a large urban school board were surveyed on their use of computer based literacy interventions, specifically, the highly successful *Academy of Reading* software program. Results indicated that: in schools using the *Academy of Reading*, staff expressed the need for more training. They also reported hardware, networking, and software problems. Scheduling and staff time to learn the program were also cited as impediments to implementation. Teachers, unlike administrators, were uncertain about the efficacy of the software, in improving student literacy – a factor that may account for their reluctance to use the program. These findings are in line with previous school ICT research. In addition staff did not feel well prepared to teach literacy to secondary school students; some staff suggested that literacy was not their task. These pedagogical issues must also be considered when assessing the use of computer based literacy interventions.

Table of Contents:

Provincial, National, and International assessments continue to confirm that although most Canadians eventually become literate, there is a relatively large percentage of the population who struggle with basic literacy tasks. International, National, and Ontario Provincial assessments all indicate that a sizable proportion of the adolescent and adult population are below age/grade expectations in reading and writing. For example, in a recent Ontario provincial assessment (Ontario Secondary School Literacy Test—OSSLT), nearly 40% of all Ontario Grade 10 students were unable to read and write at an "acceptable level" (EQAO, 2000). Similarly, in a recent national study, (Student Achievement Indicators Project – SAIP), 22% of all 13-year-olds and 29% of all 16-year-olds were not achieving in reading at national expectations (EQAO, 1999). In a recent international study of achievement (the OECD Program for International Student Assessment – PISA), overall Canadian performance on the reading assessment were recognized as being "very good." However, there was a recognition that "the existence of disparities among provinces, and between official language groups within some provinces, is a matter of concern and merits analysis." (EQAO, 2001) In addition, there was a recognition that "the lower performance levels for boys in reading will also concern policy makers in both Canada and in other countries." (EQAO, 2001)

There are a range of programs and interventions specifically designed to address this challenge. One such method involves skills based remediation delivered by computer; there is substantial research evidence indicating that several software packages are very effective in the remediation of *some* reading difficulties. The Toronto Catholic District School Board, a large multicultural, linguistically diverse urban school district, uses the *Academy of Reading*. A broad range of research supports the effectiveness of this package.

Although the *Academy of Reading* software package is extremely effective in remediating a large number of reading difficulties (e.g., Fiedorowicz, 1986; Fiedorowicz & Trites, 1987; 1990) and there are many students not at "Grade-level," there are a number of schools not using the software optimally. In this study we investigate why secondary schools have not implemented the Academy of Reading remediation software in their schools. In addition, we explore those factors that have led to full implementation.

The findings from this study is relevant to two broad ranges of indicators (as reported in the *Education Indicators in Canada: Report of the Pan-Canadian Education Indicators Program 1999*, Canadian Education Statistics Council, 2000): (i) Information and communications technologies in Canada – in particular, Obstacles to fuller use of information and communications technologies, and (ii) Student Achievement in Pan-Canadian and International Assessments -- in particular, the School Achievement Indicators Program (SAIP), reading and writing assessments, and the International Adult Literacy Survey (IALS).

Background

Information Computer Technology in the Schools: General Issues

Within the past several years there has been a strong push to bring technology into the schools, and to integrate it into the curriculum. With the increased emphasis on technology in society, it is believed that schools need to foster technological skills in students in order to prepare them to be active and successful participants in today's society. It is also believed that specific computer programs may be invaluable in increasing children's performance in specific subject areas such as reading, writing, or math. However, determining this effectiveness is difficult because here may be student benefits in addition to (or more important than) gains in literacy or math performance, traditionally measured by standardized tests. There are many benefits and difficulties associated with the use of technology in the classroom (see below) that cannot be shown by narrow standardized measures (Riley, 1999). Riley (1999) details a variety of procedures to assess the effectiveness of ICT in the classroom using formal and informal measures.

Benefits of Information Computer Technology in the Schools

Many benefits of using ICT in the classroom have been identified. Some benefits are easily measured through standard research procedures and tests – however, some benefits are much more difficult to measure and document. Benefits include:

- ❑ Increased student self-confidence;
- ❑ Immediate and individualized feedback;
- ❑ Increased enjoyment in learning;
- ❑ Developmental appropriateness of material is controlled;
- ❑ Increased motivation and attention;
- ❑ Consistency with children's approaches to learning (Nelson & Masterson, 1999);
- ❑ Fewer disciplinary referrals;
- ❑ Increased student completion of more complex homework assignments (McNabb, Hawkes & Rouk, 1999).

Challenges of Information Computer Technology in the Schools

Many school boards have spent a great deal of money on computers and computer software for their schools in hope that they would be used to advance students' technological skills as well as their reading, writing and thinking skills. After millions of dollars have been spent on technology, questions are now arising concerning the usefulness of this technology, as well as its effectiveness for student learning. Governments and school boards now want good evidence that their money is being well spent, including indicators that technology is in fact increasing students' abilities (McKenzie, 2000). Teachers would also make better use of ICT in their classroom if they saw reliable evidence that it is beneficial. However, it is important to design evaluation methods to ensure they are tapping into the real effectiveness of ICT, a task which is very difficult.

Teachers and administrators have encountered a number of challenges when attempting to integrate ICT into their programs. One major difficulty concerns the lack of sufficient money to provide the professional development required for teachers to put ICT to appropriate use (Mendels, 1999). It is not enough simply to have computers in the classroom to increase student learning. In order to see an increase in student learning, the computers need to be used in a way to integrate them into the curriculum with a focus on literacy development. Many teachers feel that they have not received enough professional development to use ICT in their classroom in a way that allows them to use technology within their particular subject, in conjunction with their particular teaching style (Trotter, 1999). A recent survey determined that only 37% of teachers felt moderately well prepared to use technology in their classroom (an additional 34% felt somewhat prepared, and 9% were not at all prepared – Trotter, 1999).

Other reasons why teachers don't use ICT include (Trotter, 1999):
- There is not enough technical support in the schools to make sure that the computers and the software are running properly; many computers sit unusable because they are not functioning.
- Not enough computers to run the software.
- Not enough time for teachers to try out the software.
- Academic subjects suffer while teachers take the time to teach ICT to their students, as well as figure it out themselves.
- Not enough time in the teachers college curriculum to train teachers to use ICT.
- Some teachers believe that ICT is not the best way to help students learn, they need more individual and personal contact with teachers.
- Difficulty finding software that suits individual teacher and student needs.

A recent Canadian study found similar impediments to the use of ICT, and in particular, the use of Internet technology in the classroom (Canadian Education Statistics Council, 2000).

Reading Intervention Computer Software

Computer assisted instruction (CAI) has become more and more popular as a means for providing intervention for the increasing numbers of learning disabled children (Hall et al., 2000). Most of these programs use a drill and practice methodology, which is then followed by strategy instruction and finally simulation. Generally these programs have proven to be effective in providing remediation for both learning disabled children, and children with severe reading difficulty, but only when combined with effective teaching strategies (Hall et al., 2000).

Many programs have been designed with the goal of improving the skills of low level, and disabled readers. One recent example of this is the *Reader's Interactive Teaching Assistant* (RITA), which was designed in order to assist the teacher in providing support that is tailored to each individual child's reading achievement. This program was found to lead to positive and cost effective literacy gains with a population of children

whose reading scores were very low (Lynch et al., 2000). This program was also found to be effective in improving the reading abilities of children at risk for reading failure at the junior level (Nicholson et al., 2000).

Another popular program designed to help improve the reading levels of students who are experiencing difficulty is *Accelerated Reader* designed by Advantage Learning Systems. This program was developed to help students choose books that are appropriate to their reading level, assess them on their reading comprehension, quiz them on the material, and provide immediate constructive feedback to the teacher and student (Renaissance Learning, 2002). The philosophy behind this program is to motivate the student to read more and better books (Pavonetti et al., 2000). Toro (2001) conducted a study to examine the effectiveness of the *Accelerated Reading* program in comparison to independent reading and found that students who took part in the *Accelerated Reader* program did not achieve higher standardized reading comprehension scores than students who only engaged in independent reading. However, when the *Accelerated Reader* program was used with economically disadvantaged children significant, gains in reading ability were found (Facemire, 2000; Vollands, 1999).

The developers of the *Accelerated Reader* program claimed that it increases student motivation to read. In a recent study by Pavonetti et al. (2000) it was found that students who participated in the *Accelerated Reader* program did not read significantly more books than students who had not participated in the program. However, in another study it was found that students with severe learning disabilities who participated in the *Accelerated Reader* program experienced improved reading comprehension and an improved attitude towards reading (Scott, 1999).

Another literacy improvement program, *NAME*, was designed to improve children's reading attainment with a computer system that gives pre-recorded speech prompts on request. Davidson et al. (1996) found that the intervention group's vocabulary gain scores were higher than that of the control group, suggesting that computers can be effective in improving reading scores.

Despite the fact that computer based programs have been shown to be generally effective for improving children's reading scores, there are still doubts that they are as effective as personal contact from teachers. Mioduser, et al. (2000) conducted a study which examined the unique contribution of computer based instruction to children's learning as compared to more conventional teaching methods. The results of this study indicated that high risk children who received the reading intervention with computer materials had significantly more improvement on phonological awareness, word recognition, and letter naming skills than the other groups which either received an intervention only with printed materials, or no intervention at all. These results suggest that computer based intervention may itself a more effective means of helping students who are at risk for reading difficulties.

While the research evidence generally support the efficacy of using computer technology for literacy interventions, it must not be forgotten that each individual student has their own learning style and learning needs. Perhaps, computer technology is not effective for every student, and some students possibly will need a variety of software options in order to find the one that suits them the best. Lange et al. (1999) responded to this by proposing that students would be helped best by a combination of different types of both instructional software and pedagogical strategies for teaching literacy. Children's reading scores increased more when they were employed a variety of software applications that encouraged the use of reading strategies across the curriculum. By integrating the technology with their reading strategies, students were able to transfer their knowledge into other content areas.

Academy of Reading Software:

This report will focus on the use of the *Academy of Reading* computer intervention program, which has been shown to be effective as a reading intervention program, and has been widely distributed to the secondary schools within the Toronto Catholic District School Board.

> "The *Academy of Reading* is a computer based training program designed to help underachieving students develop effective reading skills. The program is built on a solid foundation of research-based principles" (Autoskill, 1999).

The software uses a balanced approach to reading instruction, incorporating elements of phonemic awareness, fluency and decoding skills, automaticity principles, and reading comprehension, and utilizing a mastery approach to learning.

There is substantial research evidence that the *Academy of Reading* software package is effective in developing specific reading skills in a number of populations. Fiedorowicz and Trites, the developers of the software, along with other researchers, have conducted a number of studies on the following populations to demonstrate the effectiveness of the program:

- Socio-economically disadvantaged students (e.g., Cope, 1989; Griffin, 1988; Gutierrez & Reed, 1988);
- Individuals learning English as a second language (e.g., Burry & Fiedorowicz, 1990; Griffin, 1988);
- Reading delayed and reading disabled children (e.g., Fiedorowicz, 1986; Fiedorowicz & Trites, 1987; 1990);
- Adolescent literacy training (e.g., Fiedorowicz & Trites, 1986; Gutierrez & Coulter, 1989; Steane & Vosburgh, 1994; 1990; Vladyka, 1994);
- Adult literacy training (e.g., Burry & Fiedorowicz, 1990; Cummins, 1991; Hewitt & Cates, 1986; Muller, 1988);
- Inmate education (e.g., Buckhalt & Burton, 1988; Fredericks, 1990; Goolsby, Patton, Cozza, Lane & Wesner, 1989).

For all of the above populations, the *Academy of Reading* software was successful in improving reading levels. The *Academy of Reading* software package has been made available to all Elementary and Secondary schools in the Toronto Catholic District School Board. This software is not intended to replace the Language Arts/English program or as the only intervention. Rather, it is intended to supplement the Language Arts/English program for all students below grade level in literacy skills (i.e., for "struggling readers"). The method of training employed in the roll-out of the software package was "train-the-trainer."

Methods

Sample:

Data were collected from 34 of 35 (97%) secondary schools in a large urban School Board.   All school staff were requested to participate in the study. Questionnaires were received from 53.4% of all teachers (see below for detailed description of respondents). Further data collection, primarily to confirm and elaborate on the surveys, was collected through informal interviews with school-based staff. Results of the informal interviews and focus groups were consistent with questionnaire findings.

Measures:

The survey questionnaire used in this study was developed through a multi-step process. The instrument was developed for dual purposes: (i) to gather information about system-wide literacy instruction and initiatives, and (ii) to gather specific information about Information Communication Technology use for the purposes of literacy instruction/intervention and in particular, the *Academy of Reading*. Steps taken to develop the instrument include:

1. A list of areas of interest was developed by a group of researchers, teachers, administrators, consultants, program coordinators, and supervisory officers.
2. A set of preliminary draft questions was developed by a team of researchers. All areas of interest were addressed in the questions.
3. Questions were then presented to several "expert groups" for comment and review. Groups included:
   - ❑ A System-wide Secondary School Literacy Committee;
   - ❑ Secondary School Supervisory Officers;
   - ❑ School Board Research Department Staff.
4. Based upon comments, survey items were revised. The previously described expert groups then reviewed this penultimate draft. All comments were taken into account in the final draft.
5. Once the final form was completed, the survey questionnaire was produced in a machine-readable form, using the *Teleform* computer software package.

Included in the survey were:
        Structured Response Format Questions:
- ❑ Dichotomous response items;
- ❑ Single option multiple choice items;
- ❑ Interval format response items (Likert type)
- ❑ Multiple option multiple-choice items.

        Unstructured Response Format Questions:
- ❑ Additional comment options for single and multiple option multiple choice items;
- ❑ Open-ended opinion items.

All open response and unstructured items were coded prior to questionnaires being scanned.

Procedures:

- ❑ Surveys were developed and designed using a number of expert and representative groups.
- ❑ Prior to surveys being distributed, principals were informed about the nature of the survey questionnaire, and the importance of full participation.
- ❑ Questionnaires were couriered to all schools, including sufficient copies of the instrument for all staff to participate.
- ❑ Principals were asked to hand-deliver the questionnaires during a staff meeting, and collect responses as soon as possible.
- ❑ Responses were requested within 4 weeks. Principals from schools not responding within 4 weeks were contacted, and reminded to ensure that responses were completed and forwarded to the researchers.
- ❑ Unstructured (open-ended) questions were coded by literacy experts, using thematic content analysis in order to identify patterns and themes in responses. Codes were recorded on each questionnaire.
- ❑ Data was entered by means of high-speed scanning.

Results

Please note: a detailed summary of survey questionnaire results are recorded in Appendix 1 (below). Questionnaire results pertain to issues examined in this study, as well as more general issues of literacy instruction.

Respondent Characteristics:

1128 people responded to the survey. A breakdown of responses by position is detailed in table 1.

Table 1. Responses by Position.

Position	Responses:
Principals	23
Vice-Principals	32
Department Heads	201
Teachers	852
No response	20
	1128

Teachers and Department Heads indicated the subject areas they taught; all major disciplines were represented in the sample (see table 2, below).

Table 2. Subjects Taught by Teachers and Department Heads*.

	Responses (Percent)	
English	228	22%
Math / Science	281	27%
Social Science	220	21%
Languages	85	8%
Special Education	124	12%
Guidance	90	8%
Arts	94	9%
Business and Technology	139	13%
Religion	169	16%
Other	148	14%

Teachers and Department Heads also indicated the lowest grade that they taught; 86% of all teachers indicated that they teach Grade 9 or Grade 10 students, where the most intensive literacy instruction takes place.

Table 3. Lowest Grade Taught by Teachers and Department Heads*.

Lowest Grade Taught:	Responses (Percent)	
9	643	63%
10	233	23%
11	104	10%
12	35	3%
OAC	4	0.4%

* Not including Principals and Vice-Principals

Pre-Service And In-Service Training For Teachers In Literacy:

24% of all teachers responding to the survey had graduated from a pre-service teacher-training program in the past 5 years. 21% of all respondents indicated that they had received additional training in Special Education, and 14% had received additional training in teaching ESL. In addition, 20% of all respondents indicated that they had majored in English as undergraduates. When asked whether their pre-service teacher-training program provided them with sufficient knowledge and skills to address secondary school student literacy, only 41% responded positively (23% responded "Definitely no", 36% responded "No"). Respondents gave the following explanations for their answers:

❑ They are trained in a content area, not in literacy development.   (They feel that "literacy should be taught in elementary schools," and is "not a concern for secondary school teachers") (16%);
❑ They don't recall *any* training in literacy in their pre-service teacher training (16%);
❑ Training in language acquisition in pre-service *and additional training* was helpful (16%);
❑ Training was "too theoretical and should have been more practical" (15%);
❑ They did receive one instructional unit in Literacy during their pre-service training (11%);
❑ There "should be more emphasis on literacy in the teachable subjects" (9%).

Professional Development, Literacy Programming and the *Academy of Reading*

When respondents were asked to make general open-ended comments about literacy initiatives in their schools (of all types), they indicated that:

❑ Support and professional development are needed (14%);
❑ Effective programs are in place (11%);
❑ Cross-curricular involvement is required/needed (11%);
❑ The staff supports literacy initiatives (10%);
❑ They need more time (10%);
❑ They require additional resources (6%);

50% of all respondents indicated that literacy development was discussed in staff meetings on a regular basis. However, 58% indicated that professional development in literacy occurred in their school once per year or less (only 12% indicated that local professional development related to literacy occurred in their schools once per month or more often).

Teachers were asked about support and professional development that would improve literacy levels in their schools. Respondents were provided with a list of items, and responded on a 4-point scale, from "Definitely not helpful", to "Very helpful". Items included:

- Additional professional reading and resources and materials;
- Additional classroom materials and textbooks;
- Individual resource teacher support (for teachers);
- Individual resource teacher support (for students);
- Additional professional development;
- Additional support for student screening and diagnostic testing.

These items were all answered consistently, with 38 to 58% of respondents indicating helpful and 27 to 58% responding "Very helpful". A Chronbach Alpha test was completed for the 6 items, indicating a high degree of consistency in responses (Alpha=.83, N=979, N items=6).

When asked specifically about the *Academy of Reading*, respondents in schools using the software package indicated that in most cases there was a *staff member assigned* to monitor, supervise and implement the Academy of Reading program. (60% responded "Yes", 9% responded "No", 31% were "Not Sure"). However, only 13 to 14% of respondents indicated that there *were sufficient numbers of staff* in the school *trained* to monitor, supervise and implement the Academy of Reading program. In addition, only 14% of all respondents indicated that staff members who received the Academy of Reading training had opportunities to provide training for other staff members.

Over half of respondents who answered a question on training needs replied "in-service." In these schools where the software is being used, 41% of respondents indicated that they were not sure whether all staff members in their school had been made aware of the Academy of Reading program. An additional 21% indicated that staff had not been made aware of the program.

Attitudes

Respondents were asked to indicate the three most important factors that impede student progress. A Varimax rotated factor analysis found three factors, together accounting for 44% of the variance. The first factor (accounting for 24% of the variance), included a range of student emotional, attitudinal and behavioural items. These items generally were selected by between 50 and 62% of the respondents. Items include:

- Student behaviour / class interruptions;
- Student motivation;
- Student absenteeism;
- Support from home;
- Emotional well-being of students;
- Student attention span / distractibility.

A second factor, accounting for an additional 11% of the variance, included a range instructional, curriculum and administrative items. These items generally were selected by between 13 and 58% of the respondents. Items include:

- ❑ Scheduling / timetabling;
- ❑ Limited resources and materials
- ❑ Class size
- ❑ Provincial curriculum and expectations;
- ❑ Limited staff development.

A final factor, accounting for an additional 9% of the variance, included two items: reading proficiency and writing proficiency. Both of these items were selected by over 50% of the respondents.

When a similar Varimax rotated factor analyses were completed separately for teachers and Department Heads the response patterns were very similar (as would be expected making up over 90% of the sample). Principals and Vice-Principals, however, responded quite differently.

Table 4. Factors and items participating in factors – Varimax Rotated Factor Analysis – Principals and Vice Principals.

Factor	Items participating in the factor	Percent of Variance accounted for
Factor 1	Reading Proficiency Writing Proficiency	18%
Factor 2	Student motivation Social Pressure Student absenteeism Limited resources and materials	14%
Factor 3	Class size	12%
Factor 4	Support from home Emotional well being of students Student attention span	10%
Factor 5	Student ability Student behaviour	7%
Factor 6	Limited staff development	7%

For example, substantially more administrators indicated that scheduling and timetabling was an impediment to achievement (36% of Administrators, as opposed to 13% of teachers); in addition, only 7% of administrators believed that class size was an impediment to achievement (as apposed to 53% of teachers responding).

When responding to questions about computer based literacy interventions, administrators continue to respond in a different pattern than do teachers and department heads. Administrators were more likely to indicate that computer-based interventions are as effective or more effective than non-computer based interventions. Principals also felt much more sure in their convictions than did the teachers and department heads (See table 5).

Table 5. Attitudes toward computer based literacy interventions.

Position	More	Less	Same	Not Sure
Administrators	31%	18%	31%	20%
Department Heads	23%	18%	17%	42%
Teachers	16%	18%	23%	43%

In an open-ended item, respondents explained their answers with the following comments:
- ❑ Students interact well with computers (novelty) (24%);
- ❑ Human contact is important (18%);
- ❑ Balance is important – computer use needs to be integrated with the overall program (10%);
- ❑ Need more computers and software (5%);
- ❑ It depends upon student motivation and interest (5%);
- ❑ "Use books, not computers" (5%).

When asked specifically about the effectiveness of the *Academy of Reading* software package ("Do you feel that the *Academy of Reading* has improved the literacy levels of the students who use it regularly?"), administrators responded dramatically differently than teachers and department heads. While few respondents in all three groups indicated that the software package is ineffective, over 2/3 of all teachers and department heads indicated that they were "*not sure*" whether the software was effective.

Table 6. Attitude toward the effectiveness of the Academy of Reading software package.

	Yes	No	Don't Know
Administrators	67%	4%	30%
Department Heads	28%	5%	68%
Teachers	22%	9%	70%

Implementation of Academy of Reading

Just over half (52%) of respondents indicated that their school was using *Academy of Reading*. A higher proportion of English and Special Education teachers responded that the school was using the software package than other respondents (60% vs. 49%).

Respondents who reported that *Academy of Reading* was being used in their schools, were asked about software utilization. On average, students used the software:
- 3.5 times/week;
- 107 minutes/week;
- for a total of 20 weeks.

Respondents reported the package was used most frequently by Grade 9 and 10 students (mean 55 students/school in Grade 9 and 37 students/school in Grade 10). It was also reported to be used frequently by students in Special Education (mean 40 students/school) and by second language learners (mean 48 students/school). Fewer Grade 11 and 12 students used the package.

Respondents (n=493) who stated either that their school did not use the *Academy of Reading*, or who were "not sure" whether their school used the *Academy of Reading*, were asked why this was the case. A Varimax rotated factor analysis revealed four factors accounting for a total of 63% of the variance:
- Factor 1 (accounting for 29% of the variance) focused on staff time, work-space and administrative issues, and computer hardware issues.
- Factor 2 (accounting for an additional 13% of the unique variance) focused on lack of staff and student interest, along with lack of time.
- Factor 3 (accounting for an additional 11% of the unique variance) was comprised of staff who did not know why Academy of Reading was not implemented in their school.
- Factor 4 (accounting for an additional 10% of the unique variance) was comprised of staff who thought that other interventions were more effective for students who did not achieve well in literacy.

A large number of these respondents answered "Don't know." Relatively few participants chose the other items (2% to 15%).

A small proportion (8% of the 374 respondents who don't use the *Academy of Reading*) preferred *Accelerated Reader*; however, in a different question, very few respondents indicated that they actually used it. Others (11% of 374) thought one-on-one instruction was more effective than computerized intervention packages.

School staff who reported that the *Academy of Reading* package was used in their school were asked about the difficulties and problems that they encountered in using the software. A Varimax rotated factor analysis revealed two factors accounting for 58% of the variance:

- Factor 1 (accounting for 43% of the variance) focused on hardware, network and software problems. Between 50% and 79% of participants reported computer related problems.
- Factors 2 (accounting for an additional 14% of the unique variance) focused on problems with training, staff and student interest, supervision issues and implementation problems. Between 66% and 88% of participants expressed concern about these issues.

Discussion

Training and Professional Development

Results from the survey indicate that a large number of secondary school teachers feel that they are not prepared to address the literacy demands in secondary schools. In addition, a number of teachers indicate that their pre-service teacher training did not provide support in this area. Not all secondary school teachers feel literacy is their responsibility – however, many provincial, national, and international measures indicate that secondary school literacy is not at an acceptable level. In many cases, teachers and administrators agree that they could address literacy demands to a much greater extent if they received substantially more professional development – however, professional development appears to occurs infrequently.

With respect to the Academy of Reading software, many teachers indicated that one of the major impediments to implementing the program was limited professional development and training. It appears that in most schools using the software, a staff member is assigned to oversee the use of the program. Respondents clearly indicated that more support, training and ongoing professional development is necessary. Only 14% of the respondents indicated that there were sufficient numbers of teachers trained in the use of the software.[1] Teachers need time to learn the software and understand how to integrate the software into their larger instructional program. This finding is in line with other studies (Trotter, 1999; Canadian Education Statistics Council, 2000; Mendels, 1999) stressing the need for professional development in order for teachers to put technology to appropriate use.

---

[1] As noted above, the Board initially employed a "train-the-trainer" model of program roll-out. As a result of staff dissatisfaction with levels of training, the Board has employed a new model. The new model includes: school visits by a training team; a detailed survey of school training needs; intensive training of all appropriate staff, during school hours; ongoing technical and pedagogical support.

Challenges to Implementation

The greatest challenge to implementation, observed by schools using the intervention software, was hardware, network, and software difficulties. Respondents from these schools reported a variety of training, time, and staff/students issues impeding implementation. The main reasons reported for *not* using the software included staff time, administrative and hardware issues. In addition, respondents identified lack of staff (and student) interest, as well as a lack of time within the school day timetable as reasons for not using the software. These findings are in line with more general ICT implementation research (Trotter, 1999).

McKenzie (2000) emphasizes that teachers would make better use of ICT in their classrooms if they saw reliable evidence that is it beneficial. In the current study, teachers and department heads are consistently unsure whether computer-based interventions are superior to non-computer-based interventions. As well, the respondents appear to be unsure whether the specific intervention, the *Academy of Reading*, is effective in addressing literacy concerns. This uncertainty about the efficacy of the Academy of Reading and other computer-based interventions may underlie some of the hesitance of teachers to implement the software program.

Attitudes of Administrators and Teachers

It is interesting to note the dramatic differences in response patterns between Administrators and all other respondents to the survey. Administrators were far more certain in their views about the efficacy of the Academy of Reading and other computer-based literacy interventions. Much like teachers and department heads, few administrators indicated that these interventions are less effective than non-computer-based interventions. However, over 40% of teachers and department heads were unsure about the effectiveness of computer-based interventions, and over 65% were unsure about the effectiveness of the Academy of Reading. Only 20% of Administrators we unsure about general computer-based interventions, and 30% were unsure about the Academy of Reading. It is unclear whether this difference can be attributed to Administrators having greater access to information about programs, teachers and students, or whether teachers have a greater understanding of the needs of individual students.

Conclusion

Several issues stand out when considering the findings of this study. We investigated why some schools have not implemented a highly successful computer based literacy software package. Survey results indicate that teachers and administrators consistently indicated that student factors play an important role in impeding student progress. In addition, teachers indicated that their training has, in most cases, not prepared them for the demands of secondary school literacy. Some teachers indicated that they did not perceive this to be their task as secondary school content area teachers. When asked about what impeded or prevented them from implementing the *Academy of Reading* most teachers identified technical and training issues as major difficulties.

Current research indicates that more general computer/ICT concerns should be the greatest impediments to implementation of computer-based literacy interventions. This study confirms that these types of concerns were perceived by teachers as being central reasons for not implementing. However, more general literacy attitudes and training must also be considered when assessing the use of *literacy intervention* software. Future research will is required to determine which of these factors is most salient, with respect to implementation to computer-based literacy intervention software.

References:

Autoskill (1999). Focus on research '99. http://www.autoskill.com/products/docs/focus99.pdf.
Date accessed: February 25, 2002.

Beattie, K.K. (2001). *The effects of intensive computer-based language intervention on
language functioning and reading achievement in language-impaired adolescents.*
Dissertation Abstracts International Section A: Humanities & Social Sciences,
Vol 61(8-A). pp. 3116.

Buckhalt, R. W., & Burton, Z. T. (1988, May). *Evaluation of the computer learning program in reading.*
Education Report, Dade County School Board, Miami, FL.

Burry, J., & Fiedorowicz, C. (1990, September). *Evaluation of the Salvation Army Booth Center Literacy
Program.*

Canadian Education Statistics Council (2000). *Education Indicators in Canada: Report of the Pan-
Canadian Education Indicators Program 1999.*

Cope, F. (1989, April). *Short term sabbatical report: AutoSkill remedial reading program*. Education
Report, Parkview School, Windsor, Ontario.

Cummins, P. (1991). *The Learning Center: Adult basic education using computers*. Report to the Advisory
Council, Ottawa, Ontario.

Davidson, J. et al. (1996). A *Preliminary Study of Computer-Assisted Practice on
Reading Attainment.* Journal of Research in Reading, 19(2), pp. 102-110.

EQAO (1999). 1998 SAIP Reading and Writing Assessment (13- and 16-year-old students).
http://www.eqao.com/eqao/home_page/pdf_e/98_97/98P002e.pdf. Date accessed: February 25,
2002.

EQAO (2000). Ontario Secondary School Literacy Test, October 2000 Trial Administration October 2000
Provincial, Board and School Level Test Results.
http://www.eqao.com/eqao/home_page/07e/7_1e.html. Date accessed: February 25, 2002.

EQAO (2001). OECD Program for International Student Achievement (PISA) and Youth in Transition
Survey (YITS): PISA/YITS 2000 Ontario Report.
http://www.eqao.com/eqao/home_page/pdf_e/01/01P090e.pdf . Date accessed: February 25, 2002.

Facemire, N.E. (2000). The effect of the Accelerated Reader on the Reading
Comprehension of Third Graders. ERIC document: M.A. Thesis, Salem-Teikyo
University 53p.

Fatemi, E. (1999). Building the Digital Curriculum: Summary.
http://www.edweek.org/sreports/tc99/articles/summary.htm. Date accessed: February 25, 2002.

Fiedorowicz, C. (1986). Training of component reading skills. *Annals of Dyslexia*, 36, 318-334.

Fiedorowicz, C., & Trites, R. (1986). *AutoSkill pilot reading project*. Education Report, Wellington High
School, Wellington, Texas.

Fiedorowicz, C., & Trites, R. (1987). *An evaluation of the effectiveness of computer-assisted component reading subskills training*. Toronto: Queen's Printer for Ontario.

Fiedorowicz, C., & Trites, R. (1990). *Follow-up study of the effectiveness of the AutoSkill CRS Program*. Toronto: Queen's Printer for Ontario.

Fredericks, P. (1990). Brantford Jail, Brantford, Ontario. Personal Communication.

Goolsby, A. M., Patton, E. E., Cozza, C. R., Lane, S. S., & Wesner, N. A. (1989, May). *Unisys Icon pilot project.* Report to the Pennsylvania Department of Corrections and Pennsylvania Department of Education, Muncy, Pennsylvania.

Griffin, J. (1988, October). *Compensatory Education Program: Alisal High School.* Education Report, Salinas Union High School District, Salinas, California.

Gutierrez, G., & Reed, J. (1988, September). *An exemplary approach for children at risk.* Education Report, Sante Fe Public Schools, Sante Fe, New Mexico.

Gutierrez, E. S., & Coulter, C. (1989, June). *Project Get Ahead final report*. Report to the Sante Fe Public Schools, Sante Fe, New Mexico.

Hall, T.E., Hughes, C.A., Filbert, M. (2000). Computer assisted instruction in reading for students with learning disabilities: A research synthesis. *Education & Treatment of Children*, 23(2), pp. 173-193.

Hewitt, D., & Cates, D. (1986). *Evaluation of Icon*. Education Report, Central Piedmont Community College, Charlotte, North Carolina.

Human Resources Development Canada (2002). The International Adult Literacy Survey (IALS). http://www.nald.ca/nls/ials/introduc.htm. Date accessed: February 25, 2002.

Lange, M., McCarty, C., Norman, L., & Upchurch, N. (1999). *Improving Reading Strategies through the Use of Technology.* ERIC document: Master's Action Research Project, Saint Xavier University and IRI/Skylight.

Lynch, L., Fawcett. A.J., Nicolson, R.I. (2000). Computer-Assisted Reading Intervention in a Secondary School: An Evaluation Study. *British Journal of Educational Technology*, 31(4), pp. 333-348.

McKenzie, J. (2000). Beyond Technology: Making a difference in student performance. http://www.electronic-school.com/2000/03/0300fl.html . Date accessed: February 25, 2002.

McNabb, M., Hawkes, M., Rouk, U. (1999). Critial Issues in Evaluating the effectiveness of Technology. The Secretary's Conference on Educational Technology. http://www.ed.gov/Technology/TechConf/1999/confsum.html. Date accessed: February 25, 2002.

Mendels, P. (1999). Survey Finds Teachers Unprepared for Computer Use. http://www.nytimes.com/library/tech/99/09/cyber/education/08education.html. Date accessed: February 25, 2002.

Mendels, P. (1999). Focus Shifts to Effectiveness of Education Technology.
http://www.nytimes.com/library/tech/99/07/cyber/education/14education.html. Date accessed:
February 25, 2002.

Mioduser, D., Tur-Kaspa, H., Leitner, I. (2000). The learning value of computer-based instruction of early
reading skills. *Journal of Computer Assisted Learning*, 16(1), pp. 54-63.

Muller, P. (1988, November). *AutoSkill computer-based reading software evaluation*. Humber College
project report to the Ontario Ministry of Skills Development, Toronto, Ontario.

Nelson, L.K., Masterson, J.J. (1999). Computer technology: Creative interfaces in service delivery.
Topics in Language Disorders, 19(3), pp. 68-86.

Nicholson, R., Fawcett, A., Nicholson, M. (2000). Evaluation of a Computer-based Reading Intervention
in Infant and Junior Schools. *Journal of Research in Reading*, 23(2), pp. 194-209.

Pavonetti, L.M., Brimmer, K.M., Cipielewski, J.F. (2000). Accelerated Reader: What are the lasting
effects on reading habits of middle school students exposed to Accelerated Reader in Elementary
Grades? ERIC document: Paper presented at the Annual Meeting of the National Reading
Conference (50th, Scottsdale, AZ, November 29-December 2) 16p.

PCEIP – Education Indicators in Canada.
http://cmec.ca/pceip/1999/Indicatorssite/english/pages/page19e.html . Date accessed: February
25, 2002.

Renaissance Learning (Accelerated Reader): http://www.renlearn.com . Date accessed: February 25, 2002.

Scott, L. (1999). *The Accelerated Reader Program, Reading Achievement, and Attitudes of Students with
Learning Disabilities*. ERIC document ED434431. 64p.

Shaver, J.C. & Wise, B.S. (1990). Literacy: The Impact of Technology on Early Reading. ERIC
document: Paper presented at the Annual Meeting of the American Reading Forum (11th,
Sarasota, FL, December 12-15, 1990).

Steane, C. R., & Vosburgh, A. M. (1994, July; 1990, July). *An evaluation of the AutoSkill computer-based
reading program*. Education Report, Center Wellington District High School, Fergus, Ontario.

Toro, A. (2001). *A comparison of reading achievement in second grade students using the Accelerated
Reading Program and Independent Reading*. ERIC document: Master of Arts Action Research
Project, Johnson Bible College, 44p.

Trotter, A. (1999). Preparing Teachers for the Digital Age.
http://www.edweek.org/sreports/tc99/articles/teach.htm . Date accessed: February 25, 2002.

Vladyka, P. (1994). *An evaluation of the AutoSkill reading program*. Education Report, Humble I.S.D.
Middle School, Humble, Texas.

Vollands, S.R., Topping, K.J., Evans, R.M. (1999). Computerized Self-Assessment of Reading
Comprehension with the Accelerated Reader: Action Research. *Reading and Writing Quarterly:
Overcoming Learning Difficulties*, 15(3), pp. 197-211.

Appendix 1:

TCDSB Secondary Literacy Survey Results

Answers to Questions 1-6 are reported as numbers. All answers thereafter represent percentages, based on the number of respondents answering the question. Percentages were based on the number of respondents who answered the relevant question, not on the sample as a whole. On 'open ended' questions, responses are listed when given by at least 5% of the respondents who answered the question.

2. Position (check one):
Principal 23
Vice Principal 32
Department Head 201
Teacher 852
Total 1108 with 20 missing.

3. What subject areas do you teach? (All respondents)

English 239
Special Ed 128
Math / Science 289
Social Science 230
Languages 90
Guidance 95
Arts 97
Business and Technology 143
Religion 173
Other 162

4. Do you now, or have you ever sat on your school's literacy committee. Yes 349   No 763
    (All respondents)

What Grades do you currently teach: (2001-2002 school year). The lowest grade taught by the respondent was recorded.
Grade 9 651
Grade 10 238
Grade 11 106
Grade 12 36
OAC 4

What training and education do you have in language and literacy development?
Reading AQ 3%
Special Ed AQ 21%
ESL AQ 14%
Undergraduate English Major 20%
Undergraduate Linguistics/Psychology Major 7%
Graduate Literacy Specialization 1%
Graduate Remediation/Intervention/Assessment specialization 2%
Other AQ training 13%
Other Training 13%

7. Did your pre-service teacher training provide you with sufficient knowledge and skills to address secondary school student literacy?

Definitely no 23%	No 36%	Yes 33%	Definitely yes 8%

Explain:

Trained in subject area, not literacy / literacy is elementary school responsibility 16%
Don't recall training in literacy in preservice 16%
Training in language acquisition in preservice / specialization helpful 16%
Training theoretical: should be more practical 15%
There was a specific instructional unit in literacy 11%
There should be more emphasis on literacy instruction in teachable subjects 9%

This question was answered by 351 respondents.

8. Have you graduated from a pre-service teacher-training program in the past five years?

No 76%	Yes 24%

 These results were taken from teachers only (n=852).

Board literacy definition provided.

Does this definition of literacy match your understanding of literacy? Explain.

90% of 866 respondents answered 'yes.'   No other answer was given by more than 4% of respondents.

10. How often is literacy development discussed at staff meetings in your school?

Rarely 5%	Sometimes 44%	Most of the time 39%	Always 11%

11. How often is there local Professional Development related to literacy in your school?

Rarely 32%	Once a year 26%	Once a term 30%	At least once a month 12%

12. Principals Only
How often is literacy development (reading & writing skills) addressed in all subject areas in your school?

Rarely 3%	Infrequently 5%	Frequently 87%	Very Frequently 5%

13. Department Heads Only
As a Department Head, do you receive support at Central (Board-wide) Department Head meetings in terms of literacy?

Rarely 44%	Infrequently 34%	Frequently 17%	Very Frequently 5%

14. All Respondents:
How often is literacy addressed in your subject area(s) in your school?

Rarely 11%	Infrequently 21%	Frequently 48%	Very Frequently 20%

15. Does your school have stated Literacy Objectives?

Yes 91%	No 9%

16. If so, does your school have plans to meet stated literacy objectives/goals?

Don't know 13%	No 1%	Under Development	Yes 62%

23%

17. How familiar are you with your school's "Literacy Action Plan?"

Not at all 12%	Partially 26%	Familiar 35%	Very Familiar 16%

18. Is there general support throughout your school for student literacy?"

No 1%	Limited 7%	Somewhat 32%	Yes 60%

19. In your school, is there greater emphasis on?"

Reading 8%	Writing 10%	Equal Emphasis 81$

20. Do you have additional comments regarding general literacy initiatives and programming in your school?

Support and professional development needed 14%
Effective programs are in place 11%
Cross curricular involvement required 11%
Staff supports literacy initiatives 10%
Need more time 10%
Need more money and resources 6%

314 respondents answered this question.

21. What literacy intervention(s) (special programs) are currently available in your school?

Academy of Reading 31%
After school / lunch / summer / night school programs 18%
Resource room / Special Ed / remedial activity 14%
Literacy tests (practice and preparation) / use locally developed tests 10%
Subject specific / cross curricular focus 8%
Peer tutoring / one on one reading 7%
GLS Course 6%
Accelerated reading program 6%
Essentials course 5%

Many other interventions were cited by individual respondents.
720 Respondents answered this question.

Supports for Literacy

22. What role does the "Literacy Rep" play in your school? How could the Literacy Rep provide additional support?

Spread Information 25%
Provide leadership and support to staff 22%
Develop literacy materials and programs 15%
Attend meetings 13%
PD / Resource 12%
Coordinate literacy test and other assignments 9%
(Being a literacy rep) requires additional time / is a large burden 5%

742 respondents answered this question.

23. What role does the administration play in your school in terms of literacy? How could they provide additional support?

Provide time / resources / support to improve literacy 39%
Provide leadership and to support staff 25%
Be a member of the literacy committee 6%
697 respondents answered this question.

Tracking Student Achievement

24. How do you measure literacy achievement in the school?

Daily evaluation—regular program, rubrics, assignments, tracking progress etc 26%
Reading comprehension, writing, essays 18%
EQAO / provincial and ministry tests 15%
Gates McGinitie / standardized tests 15%
General tests and quizzes 12%
Practice literacy tests / sample questions 9%
Literacy tests and exams 9%
Ability to articulate / oral expression / participation in class 6%
Integrated literacy / cross curricular activities 5%
689 respondents answered this question.

24a. Does your school set literacy goals? If so, what goals do you set and how do you set them?

Yes 44%
No 6%
Don't know 7%

Goal General literacy improvement and success 9%
Goal Cross curricular 9%
Goal School or departmental goals 7%
Goal % improvement 7%

Strategy By committee 9%
Strategy Teachers working together / collaboration 6%

Professional Development and School Improvement

25. In order to improve the literacy levels in your school, how helpful would the following be?

a. Additional professional reading resources and materials?

Definitely not helpful 4%	Not Helpful 12%	Helpful 56%	Very helpful 27%

b. Additional classroom materials and textbooks?

Definitely not helpful 2%	Not Helpful 6%	Helpful 44%	Very helpful 48%

c. Individual resource teacher support (for teachers)?

Definitely not helpful 3%	Not Helpful 8%	Helpful 46%	Very helpful 44%

d. Individual resource teacher support (for students)?

Definitely not helpful 2%	Not Helpful 2%	Helpful 38%	Very helpful 58%

e. Additional professional development?

Definitely not helpful 3%	Not Helpful 8%	Helpful 44%	Very helpful 45%

f. Additional support for student screening and diagnostic testing?

Definitely not helpful 2%	Not Helpful 7%	Helpful 44%	Very helpful 47%

26. Select the three most helpful types of Professional Development activities for developing literacy in your school:

In school sessions 79%
Experts from within our schools 49%
TCDSB Professional Development 47%
Conferences 43%
PD from Post-Secondary Institutions 34%

27. Please indicate the three most important factors that impede student progress:
Student ability 59%
Student behavior (class interruptions) 54%
Reading proficiency 60%
Writing proficiency 56%
Student motivation 62%
Social pressure 17%
Student absenteeism 58%
Scheduling/timetabling 13%
Limited resources and materials 36%
Number of students in a class 53%
Support from home 62%
Emotional well-being of students 28%
Student attention span / distractibility 50%
Provincial curriculum / expectations 35%
Limited staff development 27%

Literacy across the Curriculum

28. What additional materials would contribute to student literacy development in your school: (Materials that you do not currently have, or do not have sufficient numbers of – please be specific -- list titles):

More tests at appropriate reading level 13%
More books, interesting books, reading materials 12%
More computers / access to computers 11%
Computer programs that work / software 10%
Novels 7%
Smaller class size /more staff / lower student-teacher ratio 6%
More literacy materials related to curriculum 5% (plus related responses – additional 3%-5%)

There were many other answers by individual respondents.
398 respondents answered this question.

29. Should literacy development be addressed in all subject areas?

No 2%	Limited Extent 8%	Somewhat 15%	Yes 76%

30. How helpful would the following items be to encourage literacy development in all subject areas?

a. Additional staff in-services?

Definitely not helpful 2%	Not Helpful 8%	Helpful 55%	Definitely very helpful 35%

b. Cross-departmental meetings?

Definitely not helpful 5%	Not Helpful 20%	Helpful 51%	Definitely very helpful 24%

c. Support from school administration?

Definitely not helpful 2%	Not Helpful 9%	Helpful 54%	Definitely very helpful 35%

d. Additional teacher resources?

Definitely not helpful 2%	Not Helpful 7%	Helpful 51%	Definitely very helpful 40%

e. Additional student/textbook resources?

Definitely not helpful 2%	Not Helpful 8%	Helpful 48%	Definitely very helpful 41%

f. Administrative monitoring?

Definitely not helpful 13%	Not Helpful 33%	Helpful 37%	Definitely very helpful 16%

Community Contacts

31. In order to encourage literacy, how helpful are community liaisons with:

a. Parents?

Definitely not helpful 5%	Not Helpful 15%	Helpful 41%	Definitely very helpful 38%

b. Elementary schools?

Definitely not helpful 4%	Not Helpful 16%	Helpful 46%	Definitely very helpful 34%

c. Post-secondary institutions?

Definitely not helpful 6%	Not Helpful 29%	Helpful 47%	Definitely very helpful 18%

d. Community partners (social agencies, community resources)?

Definitely not helpful 7%	Not Helpful 30%	Helpful 48%	Definitely very helpful 16%

How can these ties be supported or increased?

More time to make connections; PD days with elementary 17%
Meetings, information sessions in schools 14% (plus similar responses 5% to 10%)
Dialogue, partnerships 8%

348 Respondents answered this question.

Academy of Reading -- Implementation

32. Is your school currently using the Academy of Reading Software package?

Yes 52%	No 17%	Don't know 32%

33. *If your school is not using the Academy of Reading*, please indicate the reasons you are not using the software:

Don't know 47%
There is no need in the school for this type of remediation 1%
There are other successful literacy interventions in place in the school 2%
Computer hardware limitations 15%
Lack of staff interest 3%
Lack of student interest 2%
Lack of sufficient training 8%
Lack of time 6%
Lack of suitable space 6%
Organization and timetable difficulties 4%
These results are based on the 493 respondents who did not answer answered 'yes' in Question 32.

34. Is there another intervention or program you consider more effective than Academy of Reading for low performing students?
One on one tutoring 11%
Accelerated Reader 8%
There were numerous other answers by individual respondents.
374 respondents answered this question.

34a. Is this a computer based intervention? Yes 43%   No 57%   (201 responses)

35. Do you feel that computer based literacy interventions and programs are more or less effective than other interventions for low-achievers not based on computers?
        More 18%   Less 18%   Same 22%   Not Sure 42%

35a. Why?
Students interact well with computers / novelty 24%
Human contact important 18%
Balance / computer use needs to be integrated with the overall program 10%
Need more computers and software 5%
Depends on student motivation and interest 5%
Use books, not computers 5%
Results based on answers from 373 respondents.

36. Are you using a computer based instruction program other than Academy of Reading?
Yes 17%   No 83%

36a. Which Programs:
Accelerated Reader 23% (n=30)
Reading and writing achievement 13% (n=17)
Other programs and internet resources 5% (n=7)
Results based on 133 respondents.

The following questions were answered only by respondents from schools using Academy of Reading (534 respondents, according to Question 32).

37. When did you start implementing the Academy of Reading in your school?

Fall, 1999-2000 42%	Winter, 1999-2000 17%
Fall, 2000-2001 20%	Winter, 2000-2001 7%
Fall, 2001-2002 4%	Winter, 2001-2002 1%

38. How many computers are being used for Academy of Reading in your school (mean number, based on respondents answering each question)?

In a computer lab 24.0
In the library 13.5
In classrooms 5.6
In a resource room 6.0
Other 10.4

39. Are you using the Academy of Reading on Stand-alone or networked computers?

Stand-alone 4%	Networked 60%	I don't know 36%

40. Please indicate the approximate number of students using the Academy of Reading in your school.
school (mean number, based on respondents answering each question)?

Grade	Mean Students
9	55.4
10	36.8
11	16.4
12	7.3
Special Education	39.7
ESL	48.5

41. Are students withdrawn to participate in Academy of Reading, or is it administered in an inclusive classroom setting?
Withdrawal 51%
Inclusive 35%
Other 14%

42. How often do students use the Academy of Reading Software?

a. Minutes/week	b. Times/week	c. Approx. total # of weeks
106.7 (54.0)	3.5 (1.5)	20.3 (9.2)

Data represent mean (standard deviation). 5% of results were unlikely in a secondary school context, and were deleted.

42d. Is this consistent for all students using the software?

No 12%	Yes 23%	Don't know 65%

42e. If not, please explain:

Applied and essential classes use it more; used by students with low academic ability 43%
Motivation; some kids don't like it 6%
95 respondents answered this question.

43a. How are students in your school selected for participation in the Academy of Reading?

Special Ed, IPRC 29%
By need / literacy level 11%
Gates McGinitie 11%
Essential level 5%
Grade 9 screening test 5%
All Grade 9's participate
234 respondents answered this question.

43b. Did your school administer any pretests or screening instruments prior to using the software?

No 6%	Yes 33%	Don't know 60%

43c. If your school does administer pretests, which pretests/measures are used?
Academy of Reading: Phonemic Awareness Battery 61%
Reading Sub-skills Test Battery (Cloze, Oral & Silent Reading Comp.) 50%
Scores based on the 137 respondents who indicated that their schools administer pre tests in question 43b.

Several other tests are used:
Gates-McGinitie 91%
School generated informal reading tests 90%
EQAO 22%
Brigance 14%
Diagnostic tests 15%
WRAT / Monroe / Sherman 9%
CCAT results 8%
This question was answered by 77 respondents.

43d. Do you use this information for any other purposes?

No 47%
Yes 5%
Reading levels for teachers 12%
Identification, IPRC, SBST, other at risk 8%
Preparation for literacy tests 6%

130 Respondents answered this survey.

44a. Do you feel that the Academy of Reading has improved the literacy level of the students who use it regularly?

Yes 25%	No 7%	Not Sure 68%

44b. Please explain:

Not enough time to tell 10%
When used properly, there is improvement 9%
Some (?) 9%
Not enough information to track students 8%

130 respondents answered this question.

45a. Are there personnel in your school allocated or assigned to monitor, supervise and implement the *Academy of Reading* program?

Yes 60%	No 9%	Not Sure 31%

45b. What position does this person (these people) hold?

Classroom teacher 30%
EA 13%
Special Ed teacher 32%
Other 7%

% based on the approximately 534 respondents who answered the questions.

46a. Are there sufficient numbers of staff in your school trained to monitor use of the Academy of Reading program?

Yes 14%	No 34%	Not Sure 52%

46b. Are there sufficient numbers of staff in your school trained to supervise use of the Academy of Reading program?

Yes 14%	No 33%	Not Sure 53%

46c. Are there sufficient numbers of staff in your school trained to implement use of the Academy of Reading program?

Yes 13%	No 34%	Not Sure 53%

46d. Have all staff in your school been made aware of the Academy of Reading program?

Yes 38%	No 21%%	Not Sure 41%

46e. Please outline your training needs:

Inservice 51%
Not relevant to content area 10%
Time to implement 7%
Improved hardware and software 6%

141 Respondents answered this question.

46f. Did staff members who received Academy of Reading training have the opportunity to provide training for other staff members in your school?

Yes 14%	No 35%	Not Sure 51%

47. Most schools have experienced problems, difficulties, and challenges in trying to implement the Academy of Reading. Please indicate whether you/your school experienced the following challenges, and the extent of the challenge:

Problem:	Not a problem in my school	Minor difficulty	Major difficulty
a. Network problems	21%	32%	46%
b. Difficulty registering students	46%	38%	16%
c. Loss of student data	45%	32%	34%
d. Computer hardware difficulties	22%	31%	47%
e. Lack of computer hardware	27%	27%	46%
f. Computer software difficulties	25%	34%	41%
g. Insufficient training	14%	33%	52%
h. Lack of student interest	38%	34%	28%
I. Lack of staff interest	30%	43%	27%
j. Monitoring difficulties / lack of personnel	15%	34%	51%
k. Lack of a successful implementation plan	33%	37%	30%
Other	13%	35%	51%

Minor and Major problems:

A wide variety of responses were given by 62 respondents for minor issues and 86 respondents for major issues, including:

Minor:

Ordering headphones 21%
No supervision / administrator 11%
No lab 8%

Major:

Ordering Headphones 17%
Student attendance 8%
Time 7%
Not enough computers 7%