I.T.'S. R.E.A.L. NCLB Project – Baseline Year One Report

(**I**nquiry + **T**echnology + **S**cience/Social Studies + **R**eading/Riting/Rithmetic =

Engaging **A**ll **L**earners)

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Abstract

The purpose of this proposal is to describe a comprehensive professional development model aimed at reforming teachers' technology integration practices in conjunction with implementation of inquiry based approaches that incorporate nonfiction reading, writing, and math strategies. The evaluation model used random assignment of teachers and multiple measures of implementation and outcomes. Results indicate that teachers overwhelmingly report the need for training in curriculum-building as compared to assessment, technical literacy, and technology integration. Most teachers were unfamiliar with inquiry strategies, alternative math instruction, and technology literacy concepts. Teachers were familiar with and using writing strategies already in their classrooms. This report is the first stage in addressing accountability. The results of the analysis underscore the specific struggles facing educators and give support to models of reform that are flexible, comprehensive, and inclusive of all the stakeholders.

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(Inquiry + Technology + Science/Social Studies + Reading/Riting/Rithmetic =

Engaging All Learners)

Purpose

The purpose of this proposal is to describe a comprehensive professional development model aimed at reforming teachers' technology integration practices in conjunction with implementation of inquiry based approaches that incorporate nonfiction reading, writing, and math strategies. The model utilizes a multi-faceted approach by incorporating data analysis teams and mentors at the school level as well as professional development in technology standards and integration best practices and the use of inquiry in a nonfiction rich curriculum. The evaluation model uses random assignment of teacher cohorts to staggered starts of the intervention. It incorporates multiple measures of levels of intervention implementation and student outcomes, including action research, quantitative, and qualitative research methodologies.

Theoretical Framework

The promise of computing and digital technologies for K-12 classrooms has been investigated and pursued passionately by practitioners, researchers, and theorists alike. Educators have tried to unpack the variables contributing, intervening and enhancing the effects of technology on learning and achievement. System issues (like access, planning and vision), teacher issues (like skill, pedagogy, and comfort level), and the interaction of these with technologies themselves have been considered as key agents in complex models of change (Hunger, Bagley, & Bagley, 1993; Mehlinger, 1997; Tetreault, 1998; Odom & Griffin, 1999).

Claims of the effects of these technologies touch every learners in many ways: attitudes, thinking, collaborative skills, and most importantly, in this age of heightened accountability pressures, standardized tests scores across skill and content areas (Hill, 1993; Means & Olsen, 1997; Wenglinsky, 1998; Rampp & Guffey, 1998; Honey, Culp, & Carrigg, 1999; Mann, Shakeshaft, Becker, & Kottkamp, 1999; Schacter & Fagnano, 1999). The excitement of these claims is amplified by studies suggesting that minority students and students at-risk due to poverty or learning problems are not excluded from these gains when sound projects are implemented (Kozma & Croninger, 1992; Diggs, 1997; Alfaro, 1999; Thornton & Wongbundhit, 2002). Access to technologies is the key to opening the benefits to these students – access to files, telecommunications, and interactive services to bridge the real inequities that exist (Center for Science, Mathematics, and Engineering Education, 1995; Means and Olson, 1997).

The mere access of the technology, however, does not guarantee academic benefits for all students. Regardless of the student population being served, the implementation issues are the same—effectively utilizing available technology tools to enhance student productivity, support collaboration or engage students in real-life, authentic learning experiences.

The mediating factors influencing the role of technology in learner achievement have been a primary focus of researcher attention. The idea that technology's influence does not occur in a vacuum but rather is inextricably linked to instructional practice as informed many models for "best practices" in the effective integration of technology (Harel & Papert, 1990; Means et al., 1993; Tetreault, 1998; Schacter & Fagnano, 1999; Krajcik, Marx, Blumenfeld, Soloway, Fishman, 2000; Sherry, Billig, Jesse, & Watson-Acosta, 2001)

What do researchers and theorists tell us are the key factors in the transformative use of technology? One important component is conceptualizing the technology based reform in the context of the system being transformed. Change is a process that takes time and the fluidity may not be consistent across different agents in the system. Many projects have recognized the key role of teachers as an important change agent, especially in the integration of technology into daily instruction (Cradler & Cradler, 2000). Access to a sound infrastructure, both human and technological, is also considered a key prerequisite to sustained reform (Cradler & Beuthel, 2001).

Ideas on how to best frame technology-rich instructional activities in ways that maximize positive outcomes have been steadily evolving. (Schacter, 1999; Wang, Laffey, & Poole, 2001). Practitioners have worked hard to translate these theories of technology integration practices into effective training and teacher preparation models (Means & Olson, 1997; Sparks, 1997; Sparks & Hirsh, 1997; Middleton & Murray, 1999; Mills, 1999; Sparks, 1999; Killion, 2000; Christensen, Griffin, & Knezek, 2001; Shibley, 2001; Thornton & Wongbundhit, 2002; Zhao, Pugh, Sheldon, & Byers, 2002). Specifically, teachers need to know how to use and have access to the additional resources as well as to the application they have selected; an awareness of and access to timely technical guidance; to use technology applications that are consistent with their own teaching practice and pedagogy, the social dynamics of the school, the school culture (collaborative or individualistic), and the curricular goals of the school and district; and colleagues who will support and mentor them through the implementation of their innovative efforts. Teachers need time to design and receive feedback on complex new units. They need to observe others and work collaboratively to reshape curriculum aligned to content standards. And of course, they need improved technical skills.

Schools and districts need a thoughtful vision and clear plans for all these effective implementation elements to come together (Breithaupt, 2000). Some have even suggested that healthy change is progressive rather than revolutionary. School environments need to include healthy human infrastructure and functional and convenient technical infrastructure (Zhao, Pugh, Sheldon, & Byers, 2002).

Literacy and reading gains are foremost on the list of student outcomes that educators are scrambling to address. The idea of inquiry-based learning as a tool for improved content knowledge (e.g., in science or social studies) is not new. However, the notion that an inquiry based curriculum could improve student reading achievement may not be readily apparent. In order to understand how an inquiry unit could be related to reading, it is important to develop a clear picture of inquiry based learning. Inquiry is not a strategy; inquiry is not a method. Duvall (2001) refers to inquiry as "a philosophical stance an educator takes…one that uses these students' questions to frame curriculum rather than only to assess students' mastery of curriculum…" (DuVall, 2001, p. 3). Translating inquiry into the classroom involves questioning, multiple resources, collaboration, and sharing conclusions (Sullivan, 1999). It can be a cyclical authoring process (Short, Harste, & Burke, 1996). No matter what the components, students' personal and social knowledge is forefront in sharing new knowledge, taking action, and planning new inquiries.

Support for the effectiveness of inquiry based classrooms is widespread. Calls for educational reform by infusing inquiry into students' learning activities are based on increased content knowledge as well as improved motivation and engagement, especially in reading and writing (Worthy, 2000; Cambourne, 2001; Palinscar, Magnusson, & Cutter, 2002). Purposeful tasks and authentic connections are crucial elements of the inquiry based classroom. Teachers cannot expect to impart a body of knowledge that will serve students for life. Students must be taught how to ask questions, and research responsibly to find the correct answers.

While support for the inquiry method exists, understanding the role of non-fiction text in literacy is just emerging. One result of this paucity in understanding the role of nonfiction is the serious scarcity of informational text in classrooms, libraries, and as part of classroom activities (Moss, Leone, & Dipillo, 1997; Duke, 2000; Yopp & Yopp, 2000). What does research say about the value of nonfiction? First, research suggest that young children are capable of understanding nonfiction (Pappas, 1991; Pappas, 1993; Kamil & Lane, 1997; Moss, 1997; Duke & Kays, 1998; Yopp & Yopp, 2000). Research also suggests that nonfiction texts produce positive affective outcomes for students: increased motivation and interest in reading (Doiron, 1994; Caswell & Duke, 1998; Leal & Moss, 1999). Finally, informational books serve numerous purposes in the primary-grade classroom, including exposing children to a variety of text features and structures, specialized vocabulary, building background knowledge, the shifting nature of discussions and activities that contributed to understanding the purposes and processes of reading—these serve as a "catalyst to literacy" (Yopp & Yopp, 2000, 413). As students progress to higher grade levels their exposure to non-fiction text increases. Because the structures of informational text vary from those of narrative text, primary students need exposure to non-fiction to build the skills needed to read these types of texts fluently in later grades (Fielding & Pearson, 1994; Wray & Lewis, 1999; Yopp & Yopp, 2000).

Bringing the components of effective technology integration, inquiry, and nonfiction together to address the needs of our most at-risk students is a daunting task, but the value of this commitment is clear. The comments of Kozma and Croninger (1992) remain relevant ten years later. "Teachers, school administrators, and policy-makers (must) ensure that all students have access to these technologies, that the technologies are used effectively, and that other aspects of schooling also promote high levels of student learning" (p.440). In essence, equal learning opportunities for all students rely on the foundation investment in the educational community that includes but is not limited to teachers, media staff (librarians) and administrators by providing ongoing professional development.

It's Real Intervention Model

The intervention model implemented in this three year study has three primary goals:

Goal 1

Students will increase their academic achievement and technology skills as they learn to access, organize, analyze and communicate information in science and/or social science.

Goal 2

Students will increase their academic achievement in reading, math*, writing, and technology as they learn to acquire and analyze information, make decisions, and communicate findings.

Goal 3

As teachers learn the three levels of technology use – literacy, adapting, and transforming - they will incorporate strategies and activities that will enable their students to advance to the transforming level and increase academic achievement related to the Illinois Learning Standards. Students will meet or exceed their projected annual progress.

The implementation strategies to address the goals are targeted at the student level, teacher level, and building level. At the student level, Inquiry-Based Learning units aligned to the state goals for science, social science, math, and language arts are implemented. In addition, student assessments are created to measure each student's progress related to local benchmarks, state standards, and the NET Standards. Finally, technology applications and skills that will support student learning as defined in the NET standards, Porters/NCREL definition of technology uses, and NCREL Engaged Learning Indicators are incorporated into classroom activities. This focus on student needs is supported not only by building teacher capacity through technical training, instructional strategy training, and support for curriculum-building, but also through building the technology and curricular resources needed to fully implement the strategies. The resulting program incorporates human and material infrastructure building and support to create a classroom and building level culture that is ready to begin and sustain the reforms. This is accomplished by attending to material resource needs (technology and curricular), support needs (technical and mentoring), as well as embedding the time and space to actually create new curriculum.

Method

Evaluation Model

The model used to evaluate the effectiveness of this 3-year project has three major components. (Note: because of delays at the state level, funds were not disbursed for Year 1 until April 2003, technically reducing Year 1 to the last 2 months of the academic year plus three summer months. Year 2 started in September 2003).

1) Random assignment of participating teachers to staggered-starting intervention and comparison groups, based on Slavin (2002).
2) Multiple measures to establish the internal validity and implementation level in the for classroom and mentor teachers. These measures include online technical skills tests (SkillCheck), performance assessment of technical skills, two surveys measuring levels of technology use and integration of specific strategies into classroom activities, teacher implementation logs of specific inquiry curriculum units, rating of new units based on IBL rubric, as well as teacher interviews (Larsen, Mayer, Kight, & Golson, 1998; Mills, 1999; Breithaupt, 2000; Christensen, Griffin, & Knezek, 2001).
3) Multiple measures of student outcomes. Student achievement is measured by a state standardized test, local standardized tests, analysis of student computer based products, as well as student interviews (Ruiz-Primo, Shavelson, Hamilton, & Klein, 2002).

<u>Sample</u>

There are fifty-three school districts participating in the intervention. Across the three years of the project, there are 443 teachers going through training for reading, writing, math, and technology integration (Year 1= 148, Year 2= 153, Year 3= 142). For the baseline year, data were collected for 3,937 students in grades kindergarten through eighth grade (see Table 1 in Appendix A).

<u>Instruments</u>

Student Measures

Student math and reading achievement are measured using Iowa Test of Basic Skills, Terra Nova, Stanford 9 and 10, and Gates-McGinitie, and the Illinois Standards Achievement Test. Analyses for student achievement will utilize NCE scores, but only scores from the same test will be aggregated for analyses. In addition to test scores, students participating in intervention classrooms will submit technology projects that will be scored (by multiple raters) using a rubric for computer-based student artifacts.

ITBS is suitable for students in grades K-8. It was normed on the same sample as the Cognitive Abilities test (CogAT), an academic aptitude test. Internal consistency and equivalent forms are used to establish reliability. Of the 84 reliability coefficients (internal consistency) reported for the various subtests, only 6 are in the .70s; the others are in the .80s and .90s. The composite score reliabilities are all .98. Research studies are conducted to determine content validity. Stanford 9 has published reliabilities above .9 for Grade 1 and above tests. Criterion related validity coefficients (with Otis-Lennon School Abilitites Test) range from .64 - .77. Gates reliability and validity -- Age Levels Tested (Kindergarten-12 and Adult Reading). Internal consistency along with means and standard deviations for total scores and subscales for each level of the GMRT is evident for both spring and fall administrations. These are quite satisfactory and fall in the upper .80s and .90s for grades 1-12 (Swerdlik, 1992). Validity data support the intercorrelations among subtests. Validity data also provide evidence that the GMRT is a power test for assessing reading achievement at the lower and upper levels. The bulk of the validity evidence relates to providing data that support substantial relationships between the GMRT and other instruments that are assumed to measure that same constructs of reading vocabulary and comprehension. These test include general achievement screening batteries such as the Iowa Test of Basic Skills (ITBS), Tests of Achievement and Proficiency (TAP), the Comprehensive Tests of Basic Skills (CTBS), California Achievement Test (CAT), Metropolitan Achievement Test (MAT), the Survey of Basic Skills (SBS), the Verbal and Mathematics sections of the Preliminary Scholastic Aptitude Test (PSAT) and the Scholastic Aptitude Test (SAT), and the English, Math, Social Science, Natural Science, and Composite sections of the American College Test Program (ACT) (Swerdlik, 1992).

Teacher Measures

Teacher technology literacy is measured using *SkillCheck*, an online performance-based assessment. In addition, teachers complete a face-to-face performance assessment of technology skills. Finally, teachers report their levels of technology integration, use of inquiry, and comfort levels using different technologies in the Illinois *Nextsteps Toolkit*, an online survey available to all Illinois schools.

SkillCheck is an online performance based assessment of technology literacy including internet skills, basic computing, as well as most versions of Microsoft Office applications. The validity tests completed for *SkillCheck* indicate concurrent validity correlation of .64 ($p<.003$) between *SkillCheck* test score and job performance. In addition, correlations between *SkillCheck* test scores and race, age, and gender were not significant. Finally, alpha reliability of .74 and split half reliability of .80 were reported.

*Nextstep*s *Toolkit* survey and site observation instruments were created by regional office of education and learning technology center staff along with Illinois practitioners throughout Illinois under the guidance of Bernajean Porter. Content and face validity are established through the process and the alignment of the items with Illinois learning standards and NETS. Reliability is confirmed by computing alpha reliability statistics for all subtests used in the project at each administration. For the baseline administration, Cronbach's alpha = .852 (N=365).

Measures of the intervention in the classroom

Measures of the intervention in the classroom include a levels of use CBAM (Concerns Based Adoption Model; Hord, Rutherford, Huling-Ausin, & Hall, 1987; Loucks-Horsley, 1996) survey of use of inquiry, reading, writing, math, and technology integration strategies (see Appendix B). In addition, during the implementation of inquiry units created during the training, teachers complete weekly implementation logs describing their implementation of the unit. Units created by participating teachers are rated (by multiple raters) for consistency with inquiry, reading, writing, math, and technology standards. Finally, to provide formative understanding of the realities of implementing these units in the classrooms, a modified TIMSS survey adapted for use with wireless pocket PCs is used with a sample of the classrooms. Two raters are present to establish the consistency of the ratings (see Appendix C).

<u>Analysis Plan for ITS REAL Evaluation</u>

1) Pre/post comparison of teacher technology integration and literacy
2) Longitudinal analysis (using student baseline achievement data beginning 2002-2003) of student achievement data including participating and non-participating student data within the same school.
3) Longitudinal analysis of student sub-groups (rural, urban, empowerment)
4) Regression analysis of predictors of student achievement to understand any variability in student performance for participating students (e.g., teacher

technology literacy and integration levels, level of implementation, level of experience with inquiry)

5) Content analysis of student and teacher focus group transcripts as well as site visit reports and field notes to address level of technology integration.

Results

Teachers' levels of use of inquiry strategies (based on CBAM results) generally and in applications for reading and math, nonfiction reading strategies, effective technology integration issues as well as use of curriculum maps, portfolios, and differentiated instruction were analyzed. *Nextsteps* and *SkillCheck* results were also used to gauge teachers' pretest levels of technology literacy and use.

Current Teacher Practices – General Needs

Results indicate that teachers overwhelmingly report the need for training in curriculum-building as compared to assessment, technical literacy, and technology integration (see Table 2 and Figure 1 in Appendix D).

However, test results from *SkillCheck* tests indicate that more than half of the teachers failed basic and intermediate tests of their skills for general digital literacy in software, Microsoft Word 2000, and Microsoft Internet Explorer 6.0 (see Table 3 and Figure 2 in Appendix E; Note: all Year 1 and Year 2 teachers took the test for digital literacy but self-selected which internet browser for the test; Year 3 starting teachers will test in Summer 2004). Fail rates were even higher for Microsoft Internet Explorer 5.0 and Netscape 4.5, with 71% and 86% of teachers failing these tests. All teachers failing the tests participate in supplemental training before retesting.

Current Teacher Practices - Reading

An overwhelming 87% of teachers reported they were unfamiliar or had no plans of implementing Harvey's seven strategies for reading comprehension and 64% were unfamiliar or had no plans to use nonfiction text structures. The patterns for the use of QAR strategies (73%) and structured note-taking (55%) were similar (see Table 4 and Figure 1 in Appendix F).

Current Teacher Practices - Writing

More teachers were familiar with, learning more about, or using the various writing practices (see Table 5and Figure 4 in Appendix G). These strategies include writing focus (67% familiar, learning or using), writing support (68%), and writing organization (67%).

Current Teacher Practices - Math

However, math strategy use was somewhat split with fewer than half (46%) of teachers not familiar with or not using alternative means of computation but almost three quarters (71%) not familiar with or using measures of central tendencies (see Table 6 and Figure 5 in Appendix H).

Current Teacher Practices – Curriculum

Almost half of teachers (47%) reported they were unfamiliar with Inquiry Based Learning (IBL) strategies or had no plans to implement (see Table 7 and Figure 6 in Appendix I). The pattern was similar for use of concept webbing (40%), individual accountability, and authentic problems (43%). Fewer than half of the teachers (40%) were learning about or using curriculum mapping while only 46% were learning about or using professional portfolios.

Current Teacher Practices – Integration

Most teachers were unaware of technology proficiency standards (82%; see Table 8 and Figure 7 in Appendix J). Trends for technology best practices for literacy, transforming, adapting uses of technology and knowledge of information literacy were similar (77% and 73% unaware or not using, respectively).

Discussion

Understanding baseline teacher characteristics

In terms of teachers' perceptions of training needs related to technology literacy, integration, and curriculum building, though most teachers report their highest priority in terms of designing new projects using technology, *SkillCheck* results indicate that the technical literacy of these teachers is an important factor in building their capacity to implement effective

In terms of teachers' reports of knowledge and implementation of reading, writing, math, and technology integration, the results are mixed. For reading and technology integration, teachers' consistently report they are unfamiliar with or have no plans of using the reading strategies or the principles of technology integration that are the cornerstone of the project. However, almost half of the teachers reported use of estimation for math, though most were not using measures of central tendencies. Finally, teachers overwhelmingly reported the use of writing strategies already in their classrooms. It is unclear what accounts for the increased reporting of use of the writing strategies, but results generally support the need for professional development in the other areas of instruction. It is possible that the descriptors for the writing strategies are too generic and that more technical terms are need to help teachers accurately report the use of specific strategies.

Finally, clear needs for developing teachers' capacity for transforming their curricula is evident in their reports for curriculum mapping, concept webbing, professional portfolios, and basic inquiry and authentic assessment strategies.

Student Outcomes

Because this report is for the baseline year, no analysis of student data is reported. However, baseline scores for students have been collected for both standardized tests and the state tests for academic year 2002-2003.

Educational Importance

This report is the first leg in a journey to address the calls for more stringent accountability from educators and researchers. The results of the initial analysis underscore the specific struggles facing teachers and schools and give further support to models of reform that are flexible, comprehensive, and inclusive of all the stakeholders. The model for evaluating this project documents important protocols and experiences in translating the requirements of using more experimental methodologies into a balanced approach that recognizes the practical needs of schools with the validity standards of research.

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Appendix A

Table 1. Student Participants Across Grades

Grade Level	N
Missing	509
K	65
1	309
2	495
3	429
4	398
5	555
6	546
7	518
8	113
Total	3937

Appendix B

It's Real Concerns-Based Adoption Model
A Continuum for Assessing Knowledge, Understanding, and Usage

Directions: It is important to reflect on your personal development of knowledge, understanding, and use of the various topics and strategies that are a part of It's Real. Please consider your knowledge, understanding and ability to implement the following practices.

	Unfamiliar with the concept/practice	**Aware of the concept/practice but have no plans of implementing**	**I am actively learning more about the concept/practice to implement in my classroom**	**Using Occasionally in my classroom**	**Using Regularly in my classroom**
IBL Concepts / Practices					
1. Stages of inquiry					
2. Concept webbing					
3. Standards-based instruction and assessment					
4. Authentic connection for instruction					
5. Individual accountability and team performances					
Reading Concepts / Practices					
1. S. Harvey's seven reading comprehension strategies					
2. Nonfiction text structures					
3. Vocabulary strategies for nonfiction materials					
4. QAR					
5. Structured note taking					
Writing Concepts / Practices					
1. Writing-Focus					
2. Writing-Support					
3. Writing-Organization					
Math Concepts / Practices					
1. Alternative methods of computation					
2. Measures of central tendencies					
Technology Concepts / Practices					
1. Teacher Technology Proficiency Standards (NETS, IL)					
2. Literacy, Transforming, Adapting uses of technology					
3. Information literacy					
Other Concepts / Practices					
1. Curriculum mapping					
2. Professional portfolio					

Appendix C

Technology Observation Instrument

School :___________
Classroom Teacher:___________
Observer :___________

	Interval Ratings / Interval→	1	2	3	4	5	6	7	8	9	Notes / Global Session Ratings
Class Organization	(1) Individual students working alone (2) Pairs of students (3) Small groups (3+ students) (4) Whole class (5) Student presentations	(1) (2) (3) (4) (5)	(1) (2) (3) (4) (5)	(1) (2) (3) (4) (5)	(1) (2) (3) (4) (5)	(1) (2) (3) (4) (5)	(1) (2) (3) (4) (5)	(1) (2) (3) (4) (5)	(1) (2) (3) (4) (5)	(1) (2) (3) (4) (5)	**Rate Classroom Management**: □No management problems or 1-2 small problems that are dealt with smoothly and without disruption to classroom activities. □A few management issues; somewhat distracting but these are dealt with reasonably quickly □Repeated management problems OR problems that exist are not dealt with effectively; management issues are distracting or substantially occupy teacher.
Cog. Activity	(1) Receipt of knowledge (2) Applied procedural knowledge (3) Knowledge construction (0) Other (specify)	(1) (2) (3) (0)	(1) (2) (3) (0)	(1) (2) (3) (0)	(1) (2) (3) (0)	(1) (2) (3) (0)	(1) (2) (3) (0)	(1) (2) (3) (0)	(1) (2) (3) (0)	(1) (2) (3) (0)	[one right answer kinds of instruction] [more open ended, some interpretation, judge more/less impt info] [transformation of info]
Inter-action	(1) Completely Teacher-led (2) Teacher – student balanced leadership (3) Completely student led (0) Mostly indiv. student work observed	(1) (2) (3) (0)	(1) (2) (3) (0)	(1) (2) (3) (0)	(1) (2) (3) (0)	(1) (2) (3) (0)	(1) (2) (3) (0)	(1) (2) (3) (0)	(1) (2) (3) (0)	(1) (2) (3) (0)	
Student Role	(1) Passive / little response (2) Active response (3) Co-construct meaning	(1) (2) (3)	(1) (2) (3)	(1) (2) (3)	(1) (2) (3)	(1) (2) (3)	(1) (2) (3)	(1) (2) (3)	(1) (2) (3)	(1) (2) (3)	[if students presenting, focus on them] [co-construct can be individual]
Student Engagement	(1) Low engagement [in activity] (2) Moderate engagement [in activity] (3) High engagement [in activity]	(1) (2) (3)	(1) (2) (3)	(1) (2) (3)	(1) (2) (3)	(1) (2) (3)	(1) (2) (3)	(1) (2) (3)	(1) (2) (3)	(1) (2) (3)	**Rate degree to which computer tasks enable students to be self-directed** □Tasks are highly prescriptive; students make few decisions or decisions are not substantive □Tasks allow some degree of self-direction; students are allowed to guide some of their own learning activities and make a few substantive task-related decisions. □Students are able to guide and shape their own learning. They make important cecisions during the learning activity. □Not Applicable

Adapted from: M. Timms, *Technology Observation Instrument*, (2001)

School :___________
Classroom Teacher:___________
Observer :___________

	Intervals→	1	2	3	4	5	6	7	8	9	Notes
Technology Integration	(1) Not used (2) Add-on (3) Partially integrated (4) Fully integrated	(1) (2) (3) (4)	(1) (2) (3) (4)	(1) (2) (3) (4)	(1) (2) (3) (4)	(1) (2) (3) (4)	(1) (2) (3) (4)	(1) (2) (3) (4)	(1) (2) (3) (4)	(1) (2) (3) (4)	**Rate how well computer activity was integrated with today's topic:** □The technology activity does not contribute noticeably to the desired learning outcome. □The technology activity somewhat contributes to the desired learning outcome □The technology activity strongly contributes to the desired learning outcome. □Not Applicable **Rate the level of complexity of technology use:** □ Simple use of technology □ Moderately complex use of technology □ Advanced use of technology
Teacher's Technology Use	(1) Not used (2) Presentation (3) Demonstration (4) Assisting students	(1) (2) (3) (4)	(1) (2) (3) (4)	(1) (2) (3) (4)	(1) (2) (3) (4)	(1) (2) (3) (4)	(1) (2) (3) (4)	(1) (2) (3) (4)	(1) (2) (3) (4)	(1) (2) (3) (4)	(check all that were used) **Software** □ WP □DB □SS □ Presentation □ Email □ Online chat □ Browser □ DTP □ Mulimedia playing □ Multimedia authoring □ Graphics □ Web Course □ Web Authoring **Hardware** □ Computer □ Computer projector □ Printer □ Camera □ CD ROM □ CD-R/W □ scanner □ Distance room AV **Other soft/hardware (specify)** **Rate Teacher Proficiency** □N/A □Novice – unable to troubleshoot simple probs; unfamiliar with many features of soft/hardware □Intermediate – able to troubleshoot some probs; familiar with most soft/hardware features □Advanced – troubleshoot all probs efficiently; familiar with all soft/hardware features
Students' Technology Use	(1) Not used (2) Single application used (3) 2 or 3 applications used (4) 4+ applications used	(1) (2) (3) (4)	(1) (2) (3) (4)	(1) (2) (3) (4)	(1) (2) (3) (4)	(1) (2) (3) (4)	(1) (2) (3) (4)	(1) (2) (3) (4)	(1) (2) (3) (4)	(1) (2) (3) (4)	(check all that were used) **Software** □ WP □DB □SS □ Presentation □ Email □ Online chat □ Browser □ DTP □ Mulimedia playing □ Multimedia authoring □ Graphics □ Web Course □ Web Authoring **Hardware** □ Computer □ Computer projector □ Printer □ Camera □ CD ROM □ CD-R/W □ scanner □ Distance room AV □ Head Phones **Other soft/hardware (specify)** **Average number of students using technology at some point in the session** (1) 100% use technology during these intervals (2) Most use technology during these intervals (about 75%) (3) About 50% use technology during these intervals (4) Some use technology during these intervals (about 25%) (5) No students use technology during these intervals

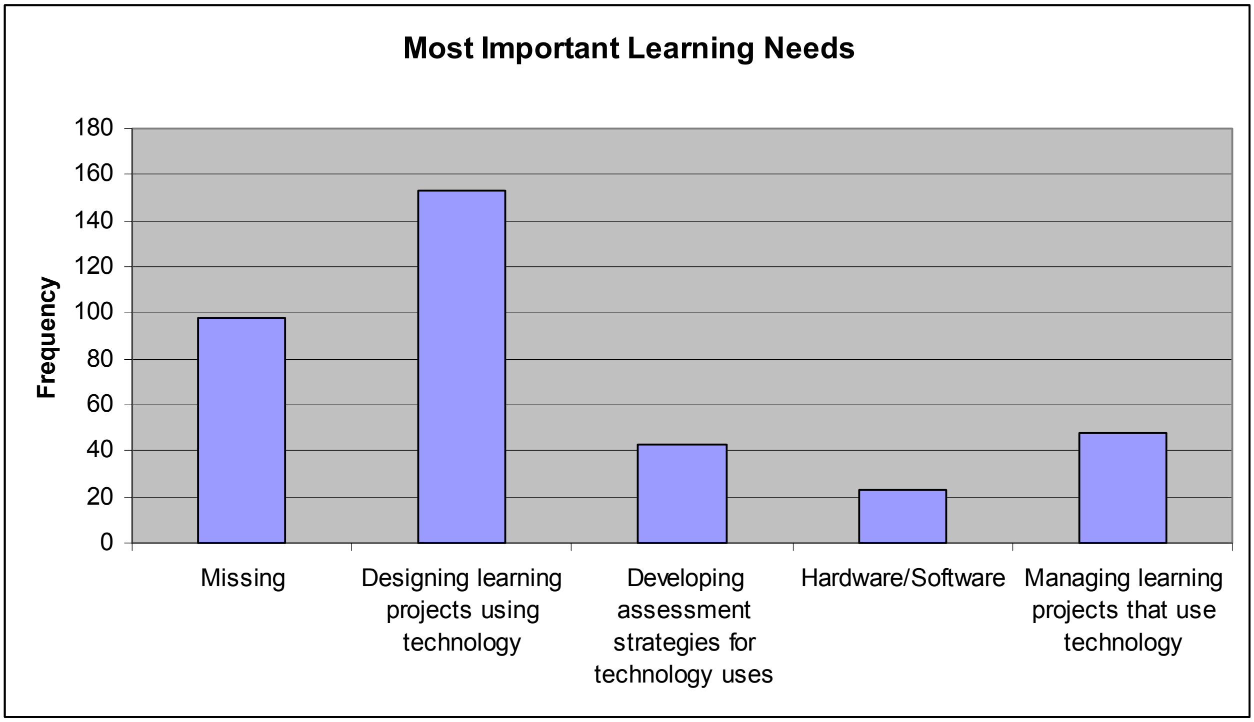
Adapted from: M. Timms, *Technology Observation Instrument*, (2001)

Appendix D

Table 2. Most Important Learning Needs

	Frequency	Percent	Valid Percent	Cumulative Percent
Missing	98	26.8	26.8	26.8
Designing learning projects using technology	153	41.9	41.9	68.8
Developing assessment strategies for technology uses	43	11.8	11.8	80.5
Hardware/Software	23	6.3	6.3	86.8
Managing learning projects that use technology	48	13.2	13.2	100.0
Total	365	100.0	100.0	

Figure 1. Most Important Teacher Learning Needs

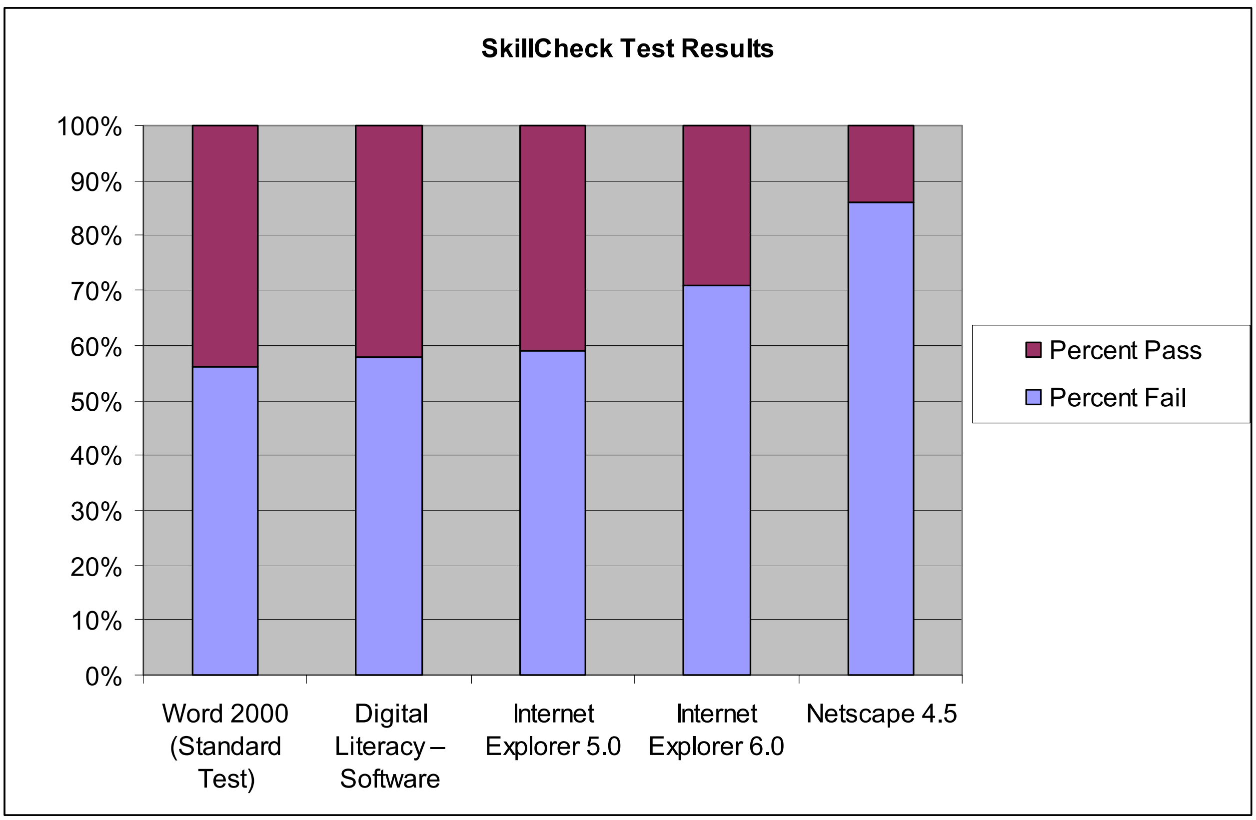


Appendix E

Table 3. SkillCheck test results

Test Name	N (taking test)	% Fail
Word 2000 (Standard Test)	300	56%
Digital Literacy – Software	312	58%
Internet Explorer 5.0	104	59%
Internet Explorer 6.0	90	71%
Netscape 4.5	70	86%

Figure 2. SkillCheck Test Results

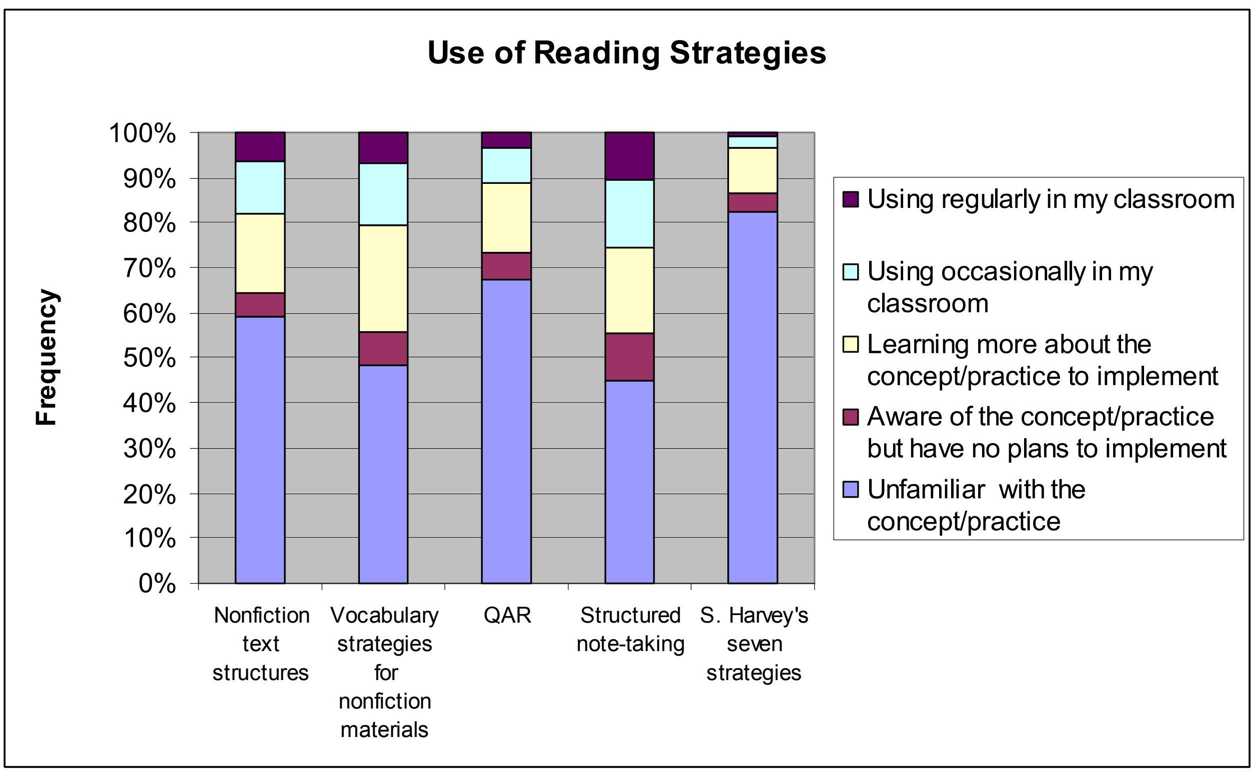


Appendix F

Table 4. Teacher Practices - Reading

	Unfamiliar with concept/practice	Aware of the concept/practice -- no plans to implement	Learning more about concept to implement	Using occas. in class	Using regularly in my classroom	Total
Nonfiction text structures	171	15	51	34	18	289
Vocabulary strategies for nonfiction materials	140	21	68	41	19	289
QAR	195	17	45	22	10	289
Structured note-taking	130	30	55	44	30	289
S. Harvey's seven strategies	238	12	29	8	2	289

Figure 3. Teacher Practices - Reading

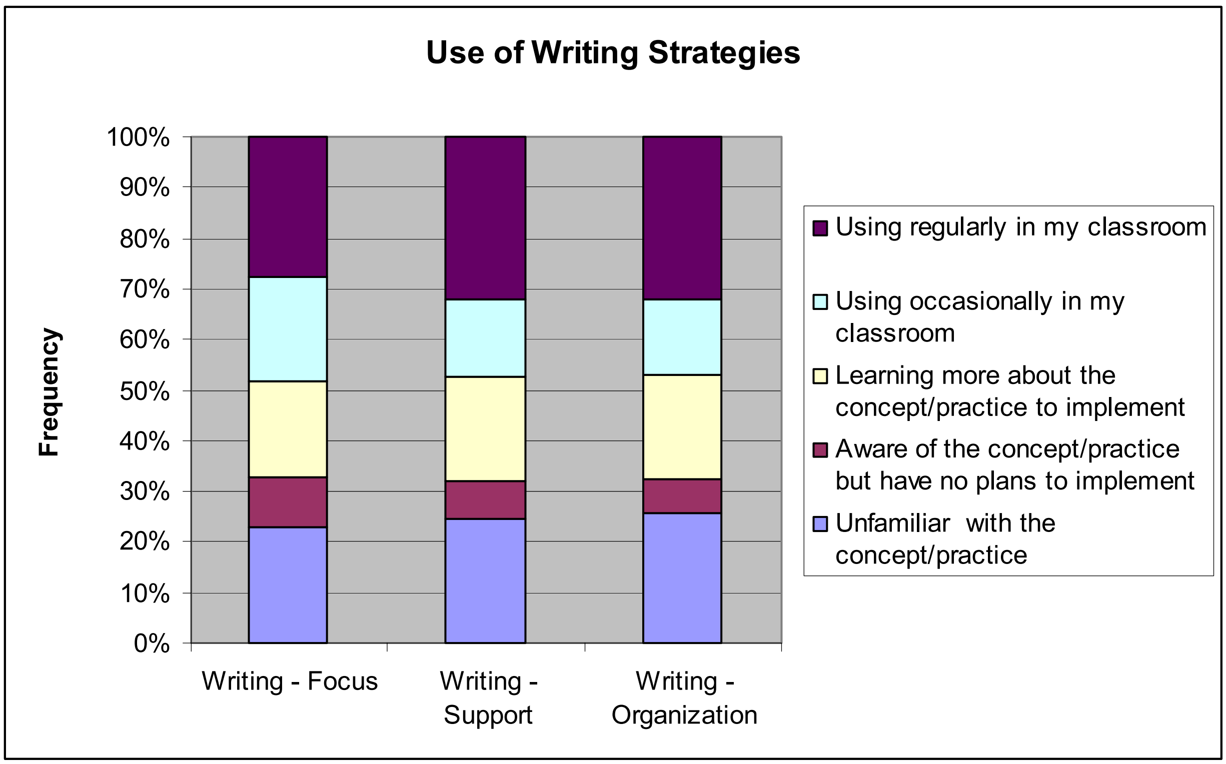


Appendix G

Table 5. Teacher Practices - Writing

	Unfamiliar with concept/	Aware of the concept --no plans to implement	Learning more about the concept to implement	Using occasionally in my classroom	Using regularly in my classroom	Total
Writing - Focus	55	23	45	49	66	238
Writing - Support	71	21	60	45	92	289
Writing - Organization	74	20	59	43	93	289

Figure 4. Teacher Practices - Writing

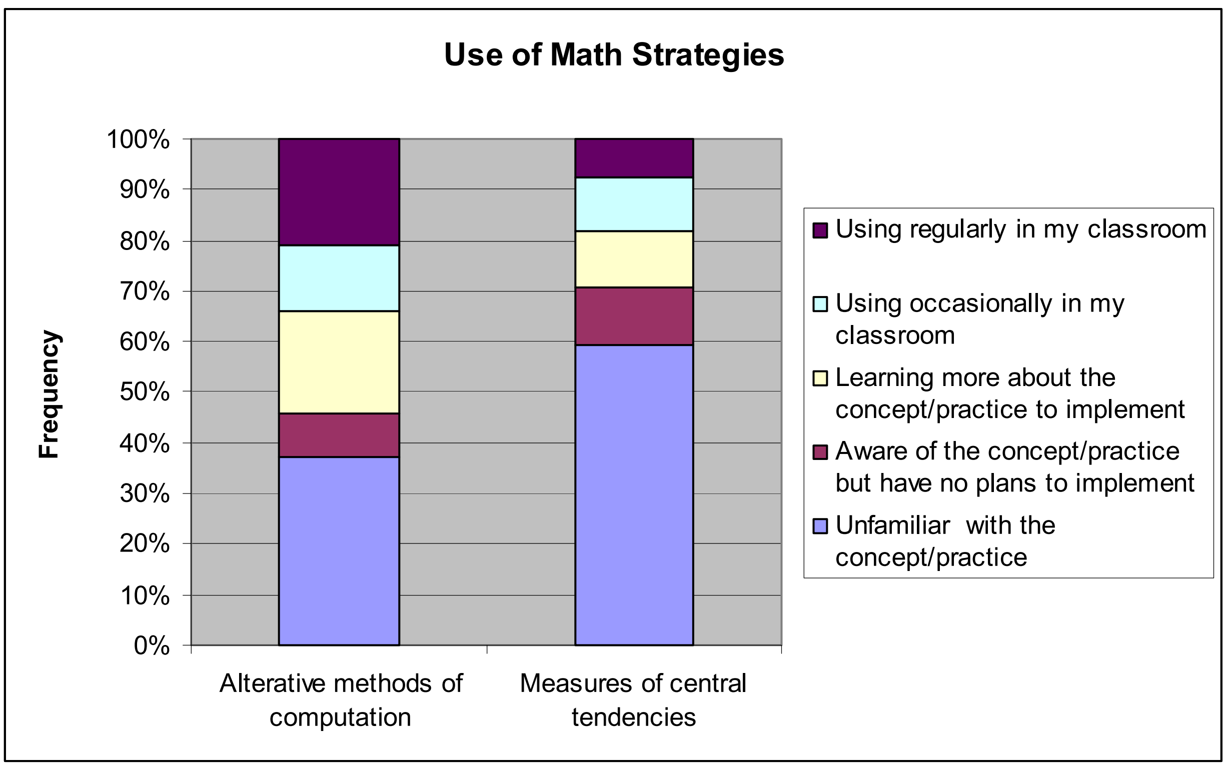


Appendix H

Table 6. Teacher Practices - Math

	Unfamiliar with concept	Aware of the concept but have no plans to implement	Learning more about the concept to implement	Using occasionally in my classroom	Using regularly in my classroom	Total
Alterative methods of computation	107	25	59	37	61	289
Measures of central tendencies	171	33	32	31	22	289

Figure 5. Teacher Practices - Math

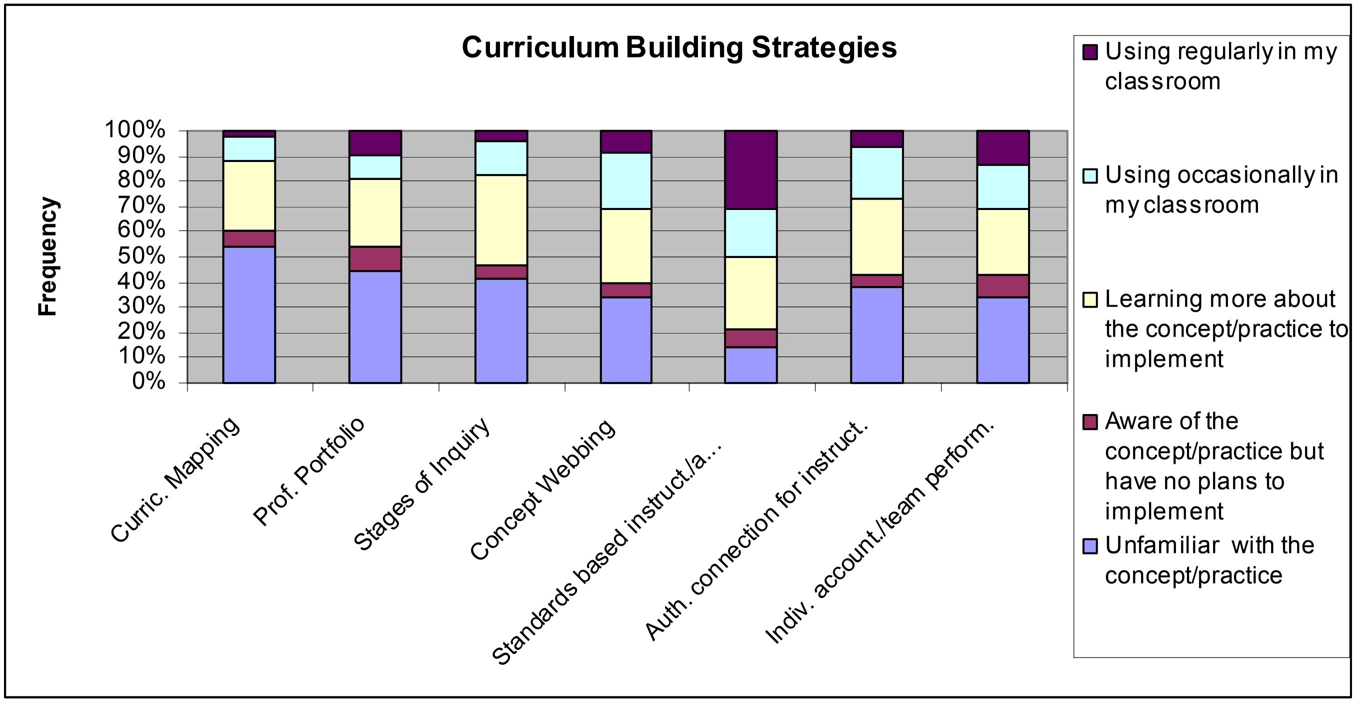


Appendix I

Table 7. Teacher Practices – Curriculum Issues

	Unfamiliar with the concept	Aware of the concept but have no plans to implement	Learning more about the concept to implement	Using occasionally in my classroom	Using regularly in my classroom	Total
Curric. Mapping	155	20	80	26	8	289
Prof. Portfolio	128	27	79	28	27	289
Stages of Inquiry	120	16	102	40	11	289
Concept Webbing	98	17	84	64	26	289
Standards based instruct./assess.	42	20	83	54	90	289
Auth. connection for instruct.	110	15	86	59	19	289
Indiv. account./team perform.	99	24	77	51	38	289

Figure 6. Teacher Practices – Curriculum Issues



Appendix J

Table 8. Teacher Practices – Technology Literacy

	Unfamiliar with the concept	Aware of the concept but have no plans to implement	Learning more about the concept to implement	Using occasionally in my classroom	Using regularly in my classroom	Total
Teacher Technology Proficiency Standards	214	24	32	16	3	289
Literacy, Transforming, Adapting uses of technology	205	18	40	21	5	289
Information Literacy	198	14	53	18	6	289

Figure 7. Teacher Practices – Technology Literacy