Multiple Source Quality Indicators for Effective Early Literacy Teaching with Technology

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Abstract

This paper shares research findings from a four phase study around the topic of
Effective Early Literacy Teaching with Technology. The four phases included an extensive
and rigorous review of the research literature on early childhood literacy and technology
integration, a Q-Method study investigating teacher belief profiles around integrating
technology with literacy instruction, a content analysis which highlighted the presence of
technology related sessions presented at a major literacy conference, and a survey of teachers
around the topic of technology integration with literacy instruction focusing on how teachers
acquire the information needed for successful integration of the two.

This paper will share the results and implications of a four phase research study which investigated the integration of literacy instruction and technology with emphasis placed on the early childhood classroom. There were two overarching research questions which guided this multi-phase study. First, the researchers sought to understand where exemplary teachers acquire professional development. Secondly, how do exemplary teachers synthesize the information gained through professional development into a form that is useful for them when integrating technology with literacy instruction?

This research study employed four methodologies which applied multiple sources of data as indicators. These methodologies included:

1. A rigorous review of the research literature,

2. A Q-method study which defined teacher belief profiles,

3. A content analysis which highlighted the presence of technology related sessions presented at a major literacy conference, and

4. A survey of teachers around the topic of how they acquire the information necessary to implement their innovative teaching strategies for integrating literacy instruction with meaningful technologies.

The rationale for engaging in these multiple methodologies underscores the unique contribution that each makes to this line of literacy research. Specifically, in this study the researchers reflect that each methodology has afforded them new insights, prompted additional inquiry, confirmed or altered their previous thinking and wonderings while moving the research forward. As Duke and Mallette (2004) remind us, ". . . many well respected literacy scholars are on record espousing the value of many different types of research" (p. 348). At the close of this multiyear four phase study, the researchers pause to reflect on their investigative journey. At the beginning, we were naïve in thinking that the first phase would elicit some final or defining information when in fact just the opposite occurred and caused

us to further question this topic. As good researchers, we knew that beginning with the

research literature was the key to our successful inquiry. This questioning continued during

each subsequent phase. We started by viewing where exemplary teachers could find the

information, and we ended with the voice of the exemplary teacher telling us where they do

find the necessary information. We believe that this journey has led us down a path that

along the way has always included and focused on the teacher.

Additionally, Duke and Mallette (2004) offer five "messages" to guide the literacy

researcher in their use of different research methodologies to inform a line of inquiry. These

messages include:

1. Many different research methods offer valuable contributions to the field,

2. Matching research questions and appropriate methodology is essential,

3. Standards of quality differ across methodologies,

4. Synergy across research methodologies is relevant, robust, and realizable,

5. Active pursuit of synergy across research methodologies is crucial.

Interesting, for the current study, the researchers believe that two of the "messages"

suggested by Duke and Mallette (2004) shepherded them in gaining new understandings.

Message two urged them to match the research questions to the appropriate methodology and

served as a beginning step for each new phase of the broader study; while message four

speaks to this particular paper as we have attempted to synergize methodologies and

synthesize our findings.

Related Theoretical Perspectives

This multiphase research study is interrelated through constructivist, New Literacies,

and Social Constructivist theoretical perspectives. Leu et al. (2004) conceptualized the New

Literacies as deictic. Therefore, it was proposed that forms and functions of literacy change

rapidly and transform with their temporal context. Employing new technologies individuals

imagined new ways of using them and altered the nature of literacy" (Leu, Karchmer, & Leu,

1999). Consequently, Labbo and Reinking (1999) constructed a framework for integrating

technology with literacy instruction. This framework encompassed digital technologies being

employed and available for literacy instruction while enhancing conventional literacy. This

framework also included the transformative effects of the New Literacies including their

ability to prepare students for the "literacy of the future" and to "empower students" (p. 481).

Social Learning Theory (Vygotsky, 1978) expresses the prominent belief that children

learn through social interaction using tools the culture provides to support thinking.

Development depends upon culturally bound sign systems scaffolded by competent

individuals to allow learners to strengthen constructions of meaning and gain increasing

independence as learners. Collaborative relationships have been found to be instrumental in

facilitating professional growth in teachers. Gee (2003) suggested that "discourse" allows for

the building of relationships of this sort and he purported,

> Discourses often constitute a "community of practice," that is, they are ongoingly
>
> engaged in and bonded together through a common set of endeavors within which
>
> they may have distinctive, but overlapping functions. . . . Such communities of
>
> practice reproduce themselves through "apprenticing" newcomers, in thought, word,
>
> and deed, to their characteristic social languages, cultural models, and social practices.
>
> (p. 37)

Taken together, these two insights anchor a belief that professional development

should shift away from solely providing content for improved teaching and focus on building

meaningful relationships amongst teachers.

Related Research Literature on Effective Professional Development

To better serve the needs of teachers in their quest to integrate technology, professional development should be thoughtfully constructed. Effective models must move beyond traditional models based on transmission of information from someone in authority to engage and empower teachers to have stronger voices in directing their own learning. Zepeda (2002) stated "a more empowering view . . . casts teachers as active participants, constructing knowledge . . . applicable to classroom practice and that engages them in more collaborative processes" (p. 84).

Collaborative relationships have been found to be instrumental in facilitating professional growth in teachers. Professional development should shift away from solely providing content for improved teaching and focus more on building meaningful relationships amongst teachers. Indeed research has shown that less than 10% of teachers implement new ideas learned in traditional workshop settings (Joyce & Showers, 1988).

Professional development should be implemented in ways that serve teachers and their needs for integrating technology in meaningful ways. Ultimately, professional development should establish environments conducive for nurturing collegial relationships. Sanders and Schwab (2001) identified "that education is a deeply human process, and that those who teach both need and deserve psychological and social support to keep their energies focused upon what is essential" (p. 277).

The most effective models of teacher professional development must move beyond the traditional model based on the transmission of information from someone in authority. Research suggests that professional development should engage and empower teachers to have a stronger voice in directing their own learning (Educational Research Service, 1998;

Lyon & Pinnell, 2001; Rob, 2000). Adults learn best in situations that reflect a constructivist

view of learning. According to Zepeda (as cited in Sandholtz, 2002),

> Learning is not only a matter of transferring ideas from one who is knowledgeable to
>
> one who is not. Instead, learning is perceived as a personal, reflective, and
>
> transformative process where ideas, experiences, and points of view are integrated
>
> and knowledge is created. (p. 816)

Zepeda further stated that, "When a constructivist perspective is applied to teacher

learning, a key focus becomes how teachers learn to make critically reflective judgments in

the midst of action and how they subsequently change their actions in response to new

insights" (p. 816).

The ultimate model of professional development will result in the formulation of

learning communities among staff members involved in the experience. Kinnucan-Welsh

and Jenlink (as cited in Sandholtz, 2002) concluded that "learning communities become

important ways of supporting individual construction of meaning and knowledge" (p. 816).

Shamburg (2004) also found that,

> An approach to professional development that emphasizes the social dimensions of
>
> learning from classroom teachers . . . would facilitate learning channels among
>
> professional developers and teachers, with an emphasis on formalizing opportunities
>
> for teachers to share and reflect with each other. (p. 242)

Phase 1 - Review of Relevant Research Literature

The researchers in the current study understand the necessity of using the work of

other researchers as a springboard for their own. Mindful of this importance, the current

study purposed the literature review to accomplish the following:

1. Delimiting the scope of the research by specifying descriptors used in the actual
    search process,

2. Opening new lines of inquiry as suggested by the analysis and interpretation of
    findings both from the researchers and their professional colleagues,

3. Avoiding fruitless approaches as this inquiry process allowed the researchers to
    update and provide new information for a confirmed methodology,

4. Gaining methodological insights as the researchers replicated some of the
    methodologies that we encountered, and

5. Identifying recommendations for further research as this first phase (a literature
    review) served as the impetus for the subsequent phases (Gall, Gall, & Borg, 2003).

The background of this phase of the research was grounded in a review of the major

recent literature focusing on the topic of early childhood literacy and the integration of

technology. Historically, a review conducted by Kamil and Lane (1998) surveyed the four

major literacy journals which included *Reading Research Quarterly, Written Communication,*

The Journal of Literacy Research, and *Research in the Teaching of English.* Of the 437

articles published during the years 1990-1995, all of which focused on school-aged children,

Kamil and Lane (1998) found only 12 articles connecting technology and literacy. Based on

their previous work, analyzing 350 articles from 1986-1996, Kamil, Intrater, and Kim (2000)

suggested six emergent themes which included; Computers and Composition, Hypermedia,

Hypertext, and Literacy, Multimedia Effects on Literacy, Special Populations, Motivation,

and Computers and Collaboration. Finally, Lankshear and Knobel (2003) continued this

study by both expanding the research literature base and focusing solely on early childhood

literacy.

Mode of inquiry

The purpose of this phase of inquiry was to investigate how the growing trend of integrating technology into the early childhood literacy curriculum (K-3) had been reflected in the classroom-based research literature during the time frame between January, 2000 through March, 2006. Moreover, this review of the literature extended the professional discussion by exploring the patterns which emerged from this analysis and offered a consideration of the current factors which are continually impacting the integration of technology into the early childhood literacy curriculum.

The researchers engaged in an extensive multi-stage analysis of the research literature on early literacy instruction and technology integration. During stage one, the authors conducted a review of the research literature on early childhood literacy and technology. In stage two, they sectioned out the classroom-based research studies and analyzed those for emergent themes. Finally, stage three offered an analysis of the emergent trends from the study of classroom-based research articles. There were six subareas of analysis through these three phases as is discussed below.

The first area of analysis involved revisiting the six categories presented by Kamil et al. (2000). The analysis required the researchers to categorize the existing articles into those six categories as appropriate. These six categories included

1. computers and composition,

2. hypermedia, hypertext, and literacy,

3. multimedia effects on literacy,

4. special populations,

5. motivation, and

6. computers and collaboration.

The second area of analysis focused on categorizing the collection of articles into the four

major literacy components which included reading, writing, speaking, and listening. The

analysis process involved determining the dominant aspect of literacy represented in the

studies. However, there were instances where two aspects of literacy worked in cooperation.

The third area of analysis focused on the determination of teacher-based versus student-based

studies. This dissection was determined by who was the primary focus of the research, the

students or the teacher. This analysis gave insights into the current thinking on professional

development and student-centered learning. The fourth area of analysis investigated the

author's purpose for the study and was analyzed through five categories which included

evaluation for standards, special populations, teaching old skills better, teaching a new skill,

and a final category that allowed for inclusion of "other" purposes. The fifth and sixth areas

were descriptive in nature and subsequently aggregated the data by year of publication and

research methodology to include both quantitative and nonquantitative. The researchers

appointed the term "nonquantitative" to include qualitative, action research, and mixed

methods studies.

Data sources

Specifically, the authors revisited the seminal review of the literature conducted by

Kamil and Lane (1998). The researchers of the current paper expanded upon the four main

review journals presented by Kamil and Lane (1998) to include other relevant research

journals of literacy, early childhood, and technology. The researchers of this paper also

utilized the key words of another literature review initially conducted by Lankshear and

Knobel (2003). Taken together, this search process generated over 3,000 articles for potential

review. From the 3,000 articles, 256 articles were then selected based upon title and abstract

alone (see Table 1). Subsequently, these articles were further reduced according to the

following criteria which included:

1. early childhood literacy,

2. technology,

3. classroom-based studies, and

4. publication during the time frame January 2000 through March 2006 thus

   narrowing the collection to 47 articles that were included in the final review.

Results and conclusions

The following section presents the data tables along with qualifying statements for

each. In this table (Table 1), attention was focused on the dates of publication for all of the

articles in general and it is important to note that the most productive year for publications

was 2003.

Although in total there were 256 articles that fulfilled the criteria of early childhood

education, literacy, and technology, the following tables present data reflecting the final

criteria of research-based studies (classroom-based studies) as originally focused on in the

research agendas of the previous reviews of this literature (Kamil & Lane, 1998; Kamil et al.,

2000; Lankshear & Knobel, 2003).

Table 1: Total Number of Literature Articles Differentiated by Year, Database, and Journal

N= 256

	2000	2001	2002	2003	2004	2005	2006	Total
Databases								
Ed. Abstracts	16	18	16	27	17	19	2	115
ERIC	2	0	2	0	0	0	0	4
Prof Dev. Coll.	1	1	0	2	15	16	3	40
Diss. Abstracts	5	7	11	11	1	3	0	38
Journals								
Early Childhood	1	1	0	4	0	0	0	6
Research-based Reading articles**	13	2	1	2	1	2	1	22
Practice Based Reading Articles***	1	4	2	4	5	2	1	19
Technology ****	0	1	1	5	4	1	0	12

* Young Children, Journal of Early Childhood Literacy and Technology

** Reading Psychology, Journal of Literacy Research, Reading Research Quarterly, Reading and Writing Quarterly, Journal of Research in Reading

*** Reading and Writing, Language and Education, Reading Teacher, Language Arts, Reading Research and Instruction

**** Journal of Educational Multimedia and Hypermedia, Information Technology in Childhood Education Annual, British Journal of Educational Technology, Proceedings of Society for Information Technology and Teacher Education International Conference

Table 2: Totals Differentiated by Six Themes and Research Methodology

Methodology	Quantitative	Non Quantitative**	Total
Computer and composition	2	11	13
Hypermedia, hypertext and literacy	17	10	27
Multimedia effects on literacy	19	13	32
Special population	5	3	8
Motivation	5	7	12
Computers and Collaboration	1	7	8

Themes represented in this table are those suggested by Kamil et. al (2000).

**On some occasions there were journals that fell into more than one theme.*

*** *The term "Non Quantitative" referred to the subset which included qualitative, mixed methods, and action research projects.*

   The six themes that formed the basis for the research were originally documented by Kamil

(2000) and subsequently provided groundwork for Lanshear and Knobel (2003). The authors

of the present study return to these six themes to align their work with the historic precedent.

In so doing the authors employed the conceptions of the original six definitions which are

described as follows:

   Computers and composition suggests that there is evidence that students produce

superior quality writing employing a word processor (Bangert-Downs, 1993). Additionally,

students also produce longer texts (Kamil et al., 2000). *Hypermedia, hypertext and literacy*

included areas in which readers were more confident creating stories, exploring material in

hypertext in greater detail and entering into digital learning environments. *Multimedia effects*

on literacy denoted the wide array of literacy-related technology skills including integrating

texts with images and animating, while also adding sound to create meaning in an effort to

access multiple intelligences. *Motivation* was seen to increase with the use of computers.

Special populations included the growing research which outlined the possibilities of

assistive technologies, including learning differences, physical disabilities, and second

language learners. *Computers and collaboration* strived to "foster higher levels of interaction

and collaboration" (Kamil et al., 2000). It is interesting to mention that special populations

and computers and collaboration were the least represented in the research literature. This

finding speaks to the discussion of the four phases of inquiry offered in the overall

conclusions and implications section found later in this paper.

Table 3: Subjects of the Research Study

Subject	Number	Percent
Student	37	79%
Student/teacher	7	15%
Teacher	3	6%

Table 3 presented the subjects of the research studies as concentration on students,

teachers, or a combination of both. The majority of studies (79%) were based upon student

subjects. Studies based solely on teachers as subjects accounted for only 6% of the total

collection.

Our results indicate that almost half (48%) of the research articles focused on the

technology as a vehicle for teaching foundational skills better. Interestingly, the research

studies centering on special populations and their uses of assistive technologies totaled

approximately 17%. It is ironic that technology, viewed as innovative practice for teaching,

was only represented by 19% of the research studies for teaching new skills.

Table 4: Purpose of the Technology

Purpose	Qualitative	Non Qualitative	Total	Percent
(1) Teaching old skills better	18	10	28	48%
(2) Teaching new skill	2	9	11	19%
(3) Special populations	7	3	10	17%
(4) Other *	1	5	6	10%
(5) Evaluation for standards	-	3	3	5%

(1) Teaching foundational literacy skills in a digitized format (ie..converting worksheets to digitized images, scanning book pages, essentially non-interactive literacy activities.
(2) The new literacies go beyond foundational literacies to include the new reading, writing, viewing, and communication skills required by the Internet and other ICT's (Information and Communication Technologies). For example, these new skills may require students to effectively use search engines, critically evaluate information on the Internet, send effective emails, effectively use word processors including the use of graphics.
(3) These would include special learning styles, mild to moderate disabilities as well as cultural diversity including English Language Learners (ELLs).
(4) Other included studies on topics such as assessment, connecting through technology, project learning, evaluations of Integrated Learning Systems (ILS) and tutoring.
(5) Technology-based assessments directly used for state and national proficiency testing.

Phase #2 – Defining Teacher Beliefs Through Q Methodology

Q-methodology provides the vehicle for uncovering and identifying the range of participant opinions regarding a specific topic of investigation. It is important to note that numerous studies have used Q-methodology as a way to reveal belief patterns and teacher attitudes (Elhoweris & Alsheikh, 2006; Pianta et al., 1995; Rimm-Kaufman et al., 2006). Stephensen (1953) and Valenta and Wigger (1997) verify that the goal of Q-methodology is to uncover different patterns of thought. As noted by Brown (1996), the instrumental basis of Q-methodology is the Q-sort technique, which conventionally involves the rank-ordering of a set of statements from agree to disagree. Usually the statements are taken from interviews and are grounded in concrete existence.

In an effort to provide a more solid foundation when designing professional development, this phase of the inquiry supported the use of Q-methodology as an appropriate tool for defining the shared belief profiles of potential participants. The research suggests that shared beliefs are an essential component of effective professional development. With this in mind, the overarching research question that guided this portion of the study investigated if Q-methodology was a viable research tool when seeking to define belief profiles in support of planning meaningful professional development.

The researchers identified many major areas of significance evolving from the analysis of the Q-sort data. Without a doubt, seminars abound that understand the nature of technological tools; however, what is lacking is an authentic understanding of the participants who will ultimately use these tools. Specifically, the researchers question the interests, skills, and beliefs of potential participants and even ponder if indeed there is a profile for such participants. Although the researchers share a particular passion for this topic and find the results of interest, they view the significance of the study through a broader lens focused more globally upon the potential of understanding belief profiles to advance relationships within interactions and exchanges of meaningful of professional development.

The overarching research question addressed through this study focused on belief profiles of educators and their integration of technology into the literacy curriculum whereas the four specific research questions that provided direction for this study included the following:

1. What are the belief profiles of undergraduate and graduate students in literacy with regard to integrating technology with literacy instruction?

2. What are the potential belief profiles of undergraduate and graduate students in technology with regard to integrating technology with literacy instruction?

3. What are the commonalities and differences of these belief profile sets, if any?

4. What are the potential belief profiles of expert groups with regard to integrating

    technology with literacy instruction?

Mode of inquiry

This study explored the beliefs of undergraduate and graduate students enrolled in

courses from two different disciplines (technology and literacy) at two urban universities as

well as classroom teachers who were nationally recognized for their expertise of integrating

technology in the literacy curriculum. Ultimately, this study sought to investigate if there

was a potential profile associated with teachers who are committed to integrating technology

in meaningful ways.

The potential participant groups for this study were purposefully selected according to

Q-Methodology guidelines. Brown (1991) suggested, "The goal in . . . the Q sample . . . is

representativeness. . . . Since the application of Q technique resolves responses into

functional types, the number of participants is generally quite small." Individual participation

in this study was voluntary and anonymous.

The instrumentation for this phase consisted of a concourse of 40 statements taken

from dissertation research conducted on the practices and beliefs of exemplary primary grade

literacy teachers and their integration of technology (see Figure 1).

Figure 1

_____

Concourse
1. Integrating technology fosters mechanical operation of the computer for the teacher.
2. Integrating technology fosters mechanical operation of the computer for the student.
3. Integrating technology fosters active learning for the student.
4. Integrating technology fosters visual literacy for the student.
5. Integrating technology fosters collaboration and team building for the teacher.
6. Integrating technology fosters collaboration and team building for the student.
7. Integrating technology fosters higher level questioning by the teacher.
8. Integrating technology fosters higher level questioning by the student.
9. Integrating technology fosters construction of new knowledge for the teacher.
10. Integrating technology fosters construction of new knowledge for the student.
11. Integrating technology fosters increased student motivation.
12. Integrating technology fosters increased teacher motivation.
13. Integrating technology foster individualized instruction.
14. Integrating technology fosters family involvement.
15. Integrating technology fosters the development of oral communication skills for students.
16. Integrating technology fosters the development of global communication for the teacher.
17. Integrating technology fosters the development of global communication for the student.
18. Integrating technology fosters modeling/demonstration on the part of the teacher.
19. Integrating technology fosters modeling/demonstration on the part of the student.
20. Integrating technology fosters research on the part of the teacher.
21. Integrating technology fosters research on the part of the student.
22. Integrating technology fosters monitoring on the part of the teacher.
23. Integrating technology fosters content integration.
24. Integrating technology fosters a democratic classroom where the teacher acts as a facilitator.
25. Integrating technology fosters "fun" in the classroom.
26. Integrating technology fosters an expansion of instructional topics in the classroom.
27. Integrating technology fosters the ability for teachers to stay current with new technologies.
28. Integrating technology fosters the ability for students to stay current with new technologies.
29. Integrating technology fosters life-long learning for the teacher.
30. Integrating technology fosters life-long learning for students.
31. Integrating technology fosters creativity for teachers.
32. Integrating technology fosters creativity for students.
33. Integrating technology fosters authentic learning experiences for the student.
34. Integrating technology fosters instructional support by the teacher.
35. Integrating technology fosters instructional support for the teacher.
36. Integrating technology enhances existing classroom activities.

37. Integrating technology fosters the development of new instructional approaches for the teacher.
38. Integrating technology fosters the discovery of new uses for technology tools for the teacher.
39. Integrating technology fosters the discovery of new uses for technology tools for the student.
40. Integrating technology fosters the realization that meaningful professional development is an ongoing process for teachers.

The Q-sort activity asked each participant to sort 40 individual cards representing the concourse of statements onto an enlarged Q-grid data sheet (see Figure 2). Each participant was asked to force rank the statements from -5 to +5 with the negative number being of least importance to them and the positive number having the greatest importance to them. After ranking the statements, participants were instructed to record the number of the statement with their choice of its placement onto a smaller version of the Q-grid data sheet (see Figure 2).

Q-Grid Data Sheet

After you have made your placements on the large grid, please record the numbers on this data sheet. Number should not be placed in the grey areas.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5

Thank you for your participation.

Figure 2. Q-grid data sheet.

PQ Method 2.11 software was the statistical tool used to enter the Q-sort data in an electronic manner. The PQ Method 2.11 computed correlations among and between sorts as well as allowed the researchers to rotate the factors in a variety of ways. Factors in Q-Method can be defined as categories that emerged and reflected the subjectivity of the participants' responses to these Q-sorting activities.

Data sources

The data sources for this phase included the concourse and Q-grid data sheet *(see Figures 1 and 2).* The following tables represent and indicate the top three favorable choices as well as the bottom choices selected by participants during the Q-sorting activity.

Table 5: Top and Bottom Choices

Factor # 1

Top 3 Choices

Integrating technology fosters authentic learning experiences for the student.
Integrating technology fosters increased teacher motivation.
Integrating technology fosters active learning for the student.

Bottom Choice

Integrating technology fosters mechanical operation of the computer for the teacher.

Factor # 2

Top 3 Choices

Integrating technology fosters fun in the classroom.
Integrating technology fosters increased teacher motivation.
Integrating technology fosters active learning for the student.

Bottom Choice

Integrating technology fosters the development of global communication for the teacher.

Factor # 3

Top 3 Choices

Integrating technology fosters the ability for students to stay current.
Integrating technology fosters creativity for teachers.
Integrating technology fosters the ability for teachers to stay current.

Bottom Choice

Integrating technology fosters collaboration and team building for students.

Factor # 4

Top 3 Choices

Integrating technology fosters life-long learning for the teacher.
Integrating technology fosters the development of new approaches for the teacher.
Integrating technology fosters the ability for teachers to stay current.

Bottom Choice

Integrating technology fosters a democratic classroom.

Table 6: Compilation of Factor Loadings of All Sub groups

	Factor #1	Factor #2	Factor #3	Factor 4
Expert Group N= 4	3	0	1	0
Graduate Student Techlit N=1	1	0	0	_
Graduate Students Literacy N=9	0	3	4	2
Graduate Students Technology N=13	7	2	3	_
Undergraduate Students Literacy N= 21	1	7	9	2
Undergraduate Students Technology N= 10	0	3	3	2

Factor Table – noting number of participants who were statistically significant for each group

Results and conclusions

The overall findings of this phase suggested that there were indeed the beginnings of potential profiles for those most likely to integrate technology in meaningful ways in the literacy curriculum. The researchers re-visited the content of the four research questions that guided this investigation as a context for further discussion of the findings.

What are the belief profiles of undergraduate and graduate students in literacy with regard to integrating technology with literacy instruction? Although there is no conclusive definition of individual profiles, the researchers noted that graduate students in literacy loaded onto many of the same factors as those of undergraduate students in literacy. Statement characteristics from these factors suggested a lack of technological sophistication. Moreover, they portray participants who are more concerned with the concrete operations of day-to-day classroom literacy events.

What are the potential belief profiles of undergraduate and graduate students in technology with regard to integrating technology with literacy instruction? In contrast to their colleagues in the literacy field, undergraduate and graduate students in technology did not appear to load onto the same factors. There was a significant loading of graduate students in technology as opposed to undergraduate students in technology onto Factor 1, which exemplified a more accomplished approach to teaching with technology in meaningful ways. Perhaps this is not surprising when one looks closely at undergraduate technology educational courses. Overwhelmingly, the technology skills taught in these types of courses rely heavily on those skills employed by the teacher for clerical purposes and instruction. In

contrast, the graduate students in technology focused their use of these innovative tools for

the improvement and enhancement of student learning in their classrooms.

What are the commonalities and differences of these belief profile sets, if any? There

were obvious commonalities and differences between the suggested profiles of the

participants during this investigation. Indeed, Factors 1, 2, and 3 appeared during the entire

study and a fourth new and completely unique factor emerged during the later part of data

collection. What this suggests is that with additional participants, the loadings from each

individual were more aligned and converged closely around each factor. In other words, the

factors were better able to differentiate the typology of the participants encountered in this

study. This supports the researcher's notions that a more distinct profile of each factor

emerged after the final analysis of all available data.

What are the potential belief profiles of expert groups with regard to integrating

technology with literacy instruction?

The expert group loaded noticeably onto Factor 1 which defined a more abstract

thinker who looks toward the future and what their students will need in their life as adults in

the twenty-first century and beyond. As we visited Factors 1 through 4, the skills moved

from the abstract (Factor 1) to become more concrete and applicable to day-to-day classroom

operations (Factor 4).

Phase #3 – Investigating the Presence of Technology Related Sessions at Major Literacy Conferences through Content Analysis

This phase maintained fidelity with the steps specified by Borg et al. (2003) while

undertaking a quantitative analysis. The analysis was driven by research questions and a

defined objective, a sample was selected for review, and categories were developed for

coding.

Specifically, during this phase of the study, the researchers revisited the initial investigation into available sources of professional development for meaningful integration of technology into the early childhood literacy curriculum. It was a natural segue to advance the inquiry to include the exploration of topics at a national literacy conference over a period of years.

A content analysis of the programs of this annual national literacy conference was conducted to advance this research phase. A systematic review of session topics presented between the years 2005 and 2008 was undertaken in concert with the defined purpose of a content analysis being "a research technique for the objective, systematic, and quantitative description of the manifest content of communication" (Berelson, B., 1952 as referenced in Borg et al., 2003, p. 278). Indeed, employing content analysis has been valued as an appropriate methodology to investigate conference proceedings in a variety of fields including medicine, law, and music (Barbaret, 2007; Ortiz, 2005; Scherer, 1985).

As we transition this inquiry to the discipline of "literacy" the purpose was two-fold for conducting a quantitative content analysis of the conference proceedings at a major annual meeting for the field. First, the researchers sought to investigate the importance of the five essential components in popular practice by quantifying their presence at the major literacy event. Secondly, the researchers sought to capture emerging literacy themes by noting their presence in the conference sessions. These objectives were guided by the following research questions:

1. What is the alignment between the five essential literacy components and the session topics presented at a major literacy conference between the years 2005-2008?
2. What literacy themes and/or topics emerged from the sessions presented at a major literacy conference between the years 2005-2008?

Mode of inquiry

The researchers analyzed the conference proceedings from a national literacy

conference between the years 2005-2008. The researchers coded only topics listed as

"sessions" which did not include workshop sessions, roundtable sessions, or keynote

presentations. The rationale for this was that at this major conference, "sessions" undergo an

extensive review process and were therefore considered "peer reviewed" and more

representative of the field. Sessions addressing the five essentials were noted for each year.

Additionally, a list of popular topics of the sessions presented at the conference emerged for

each year. Categories for these topics were collapsed with the following consideration: topics

with only one session were considered as "outliers" and topics with two or more session were

included in the list for a particular year. After evaluation of all inclusive years, the topic list

was further collapsed by reviewing topics appearing in only one year.

All conference sessions were coded according to a template (see Figure 3). To ensure

reliability and validity through the coding process, the research cross coded the data to

confirm that identical coding procedures were conducted.

<div align="center">Template for the Conference Presentations</div>

Conference:
Year:
Presentation Title:

Date:
Day of conference:

Time of presentation:
Morning   Midday   Afternoon   Late Afternoon

Focus of presentation:
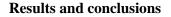
Page Number of Conference Booklet
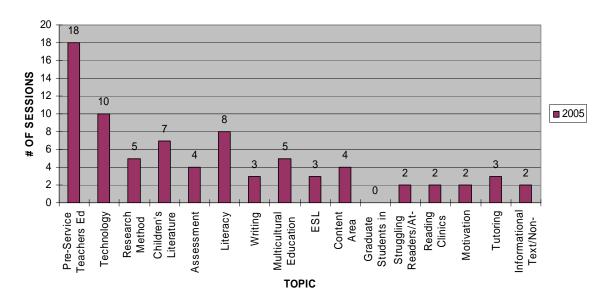
Additional information:

_____

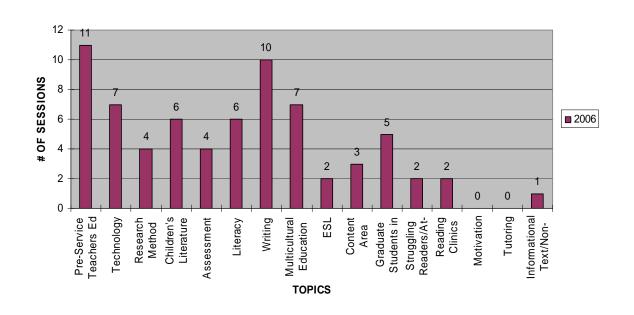Figure 3. Template for conference presentations.

Data sources

The data sources for this phase included the conference program booklets from a

major literacy conference for the years 2005-2008.
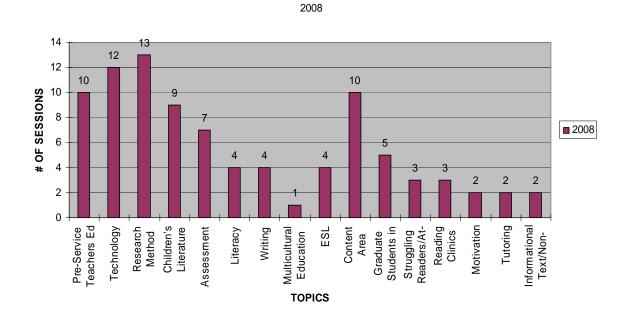
Results and conclusions

2005

2006

2007

2008

Figure 4. Number of sessions and topics 2005 to 2008.

PHONEMIC AWARENESS

PHONICS

	Sessions @ CRA 2005	% Hot 2005	% Should be Hot 2005	Sessions @ CRA 2006	% Hot 2006	% Should be Hot 2006	Sessions @ CRA 2007	% Hot 2007	% Should be Hot 2007	Sessions @ CRA 2008	% Hot 2008	% Should be Hot 2008
Value	0	0.75	0.5	0	0.75	0	0	0.5	0.5	0	0	0

VOCABULARY

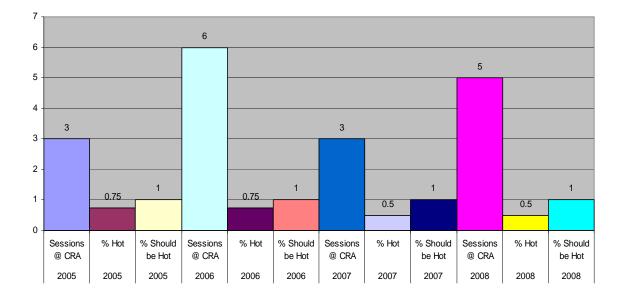|	Sessions @ CRA 2005	% Hot 2005	% Should be Hot 2005	Sessions @ CRA 2006	% Hot 2006	% Should be Hot 2006	Sessions @ CRA 2007	% Hot 2007	% Should be Hot 2007	Sessions @ CRA 2008	% Hot 2008	% Should be Hot 2008
Value	11	0.5	0.75	3	0.75	0.75	3	0.5	0.75	1	0.5	0.75

FLUENCY

COMPREHENSION

Figure 5. Phonemic awareness, phonics, vocabulary, fluency, and comprehension 2005-2008.

The impetus for constructing this phase of inquiry was to investigate how many

technology sessions were represented at a major literacy conference. Surprisingly, the

researchers discovered that technology as a topic was consistently represented at the

conference between the years 2005-2008. Additionally, topics such as "children's literature"

and "content area reading" were also prevalent between the years 2005-2008. The analysis of

data also illustrated that "assessment" was yet another topic to note. In 2005 and 2006, the

field only recognized "high stakes" assessment. In 2007, assessment as a topic was

represented by two categories including "high stakes assessment" and a new topic,

"curriculum-based assessment."

The total number of sessions focused on the five essentials was reduced in number

each year as is noted; *2005 = 16 (15%), 2006 = 11 (13%), 2007 = 9 (11%)*, and *2008 = 8*

(7%). Across the board, comprehension and vocabulary were represented in all years.

Phonics was the least represented topic with 0% of sessions involving this topic. Phonemic

Awareness and Phonics combined were represented less than 1% at the conference. Fluency

was steadily increasing through the years with almost 2% of all sessions represented over the

years 2005-2008 with vocabulary and comprehension increasing a little over 4% between the

years 2005-2008.

An overarching finding from the analysis revealed that the majority of presentation

sessions were devoted to topics other than the five essentials. The following table indicates

the number of sessions analyzed per year as well as those topics (beyond the five essentials)

which emerged from the analysis:

Table 6: Conference Session Number & Topics Differentiated by Year (2005-2005)

Topic	2005	2006	2007	2008
Preservice Teachers Ed.	18	11	11	10
Technology	10	7	6	12
Research method	5	4	7	13
Children's Literature	7	6	4	9
Assessment	4	4	10	7
Literacy	8	6	5	4
Writing	3	10	5	4
Multicultural education	5	7	4	1
ESL	3	2	3	4
Content Area Reading	4	3	4	10
Graduate Students in Literacy	0	5	0	5
Struggling Readers/At-risk readers	2	2	1	3
Reading Clinics	2	2	0	3
Motivation	2	0	3	2
Tutoring	3	0	0	2
Informational Text/Nonfiction	2	1	0	2
Literacy coaching	1	0	0	4
Teacher Beliefs	2	0	0	1
Reading First	0	2	0	1

* Not listed as General Literacy/ please refer to adolescent, preschool, and family literacy which are differentiated on the list.

Table 7: The Five Essentials and Number of Sessions Differentiated by Year

Essential	2005	2006	2007	2008
Phonemic Awareness	1	0	1	0
Phonics	0	0	0	0
Vocabulary	11	3	3	1
Fluency	1	2	2	2
Comprehension	3	6	3	5

Phase #4 – Interviewing Through Focus Groups to Investigate Teacher Beliefs and Instructional Practices When Integrating Technology With Literacy Instruction

In this final phase of the study the focus returns to the classroom teacher and an ear is given to their voice. Focus group methodology was employed to allow the researchers direct interaction with teachers who successfully employ technology in the early childhood classroom in meaningful ways. As Stewart and Shamdasani (1990) suggest, focus groups permit the respondents and researcher to interact and help respondents build synergistically upon their discussions. Meanings are often deepened in this flexible environment which is particularly useful with literate individuals such as early childhood educators. Although there are many benefits, certain limitations are inherent in the methodology which must also be considered. Most significantly, the small number involved in a focus group prohibits broad generalizations; additionally, the interaction may limit independence of thought in the responses. Despite these limitations the focus group methodology was selected to conclude this multi-phase study in order to understand how respondents talk about a particular phenomenon and lend structure and interpretation to previously obtained results.

The goal of the conversation was to allow teachers the opportunity to share their voices as they discussed both their classroom and professional experiences related to meaningful technology integration with literacy instruction. Therefore, the following research questions guided the focus group discussion:

1. What technology do you currently use in the classroom?

2. How do you currently integrate technology with literacy instruction? How has this changed over time?

3. Where and how do you acquire the information needed to support your successful integration of technology?

Mode of inquiry

The nature of the focus group was upheld by a nonthreatening environment around a dinner table. Participants were offered a broad overview of the topics to be discussed prior to coming to the focus group session. Consideration for the least talkative individuals was detailed in their placement around a large dining table which also afforded eye contact between all members of the group as well as the discussion facilitators. Respondents were given a pen and paper to jot down thoughts that might have been prompted by colleagues' responses as the discussion unfolded. At the onset of the session, the respondents were asked for permission to record the discussion which was granted by all. As the session began, each participant was asked to briefly introduce themselves to the larger group. The facilitators assured each participant that their input was valuable and indeed essential to success of the discussion. As the interview transpired, careful attention to time spent on each question was monitored to ensure that each very important topic was carefully considered and integrated into the discussion. The discussion was fruitful and extended over a three hour period which included dinner and dessert.

Focus group methodology is a viable mode of inquiry when investigating teacher beliefs and practices in the early childhood domain (Laffey, 2004; Makin et al. 2000).

Data sources

The data sources for this phase of inquiry include the tape recordings as well as the transcription of the focus group discussion.

Results and conclusions

The following discussion of results and conclusions is centered on the three research questions guiding this investigation. Through an analysis of the teacher interview transcripts, findings emerged which included the following:

1. Teachers as technologists,

2. Funding and grant opportunities to support technology integration,

3. Sufficient time to implement and integrate technology in meaningful ways,

4. Emulation of real world technology applications within the classroom, and

5. Collaboration and collegial team building between and amongst teachers.

These five are further discussed and illustrated within the context of each of the following research questions which served as the foundation for this investigation.

What technology do teachers currently use in their classrooms? The data indicated that six out of the seven teacher participants currently used Smart Board technology in their classrooms. In addition, they coordinated the Smart Board with peripherals such as Elmo Projectors, Digital Cameras, Image Projection Devices, and Digital Recorders. In all of the classrooms computers were accessible for students to use on a regular and ongoing basis. Students had access to computer programs including Accelerated Reader, I Excel, STAR Math, STAR Reading, and EarRobics. As one teacher noted,

> We have fantastic classroom programs and great technology in the classrooms. There
>
> isn't enough time in the day to utilize it effectively. . . . We are working on overload.

> My Elmo sat . . . for two months. I wasn't ready for it because I didn't know. Now
> that I have it, I use it every day, all day long. I don't get the overhead out. (Focus
> Group, 3/3/10)

The teachers in this particular school are collaborative and heavily rely on their colleagues as resources and are supportive of each other's professional growth. This is evidenced in the following statement: "We're very rich in the resources that we have compared to some of the buildings. We're lucky that we have people trained. [We] support each other" (Focus Group, 3/3/10).

Even in this very supportive school community, one teacher noted that there yet remains a number of road blocks. One such issue is related to sources of electrical and bandwidth power within the district necessary to maintain functional levels for the technology. This is suggested in the following comment, "The other issue is, we are still working on service to the whole school for the computer. They keep adding and adding programs. They have done some changes downtown. I don't think they can move fast enough to keep enough" (Focus Group, 3/3/10). Additionally, cooperation within the district impedes authentic use of the Internet. As all participants agreed, "When you find a good place you would love your students to use, a lot of our computers are not able to utilize that" (Focus Group, 3/3/10). Certainly, the biggest controversy is the proprietary nature of some of the commercial vendors with whom the district has purchased site licenses which prohibits the teacher from engaging in extensive planning opportunities outside of their classrooms as teachers bemoan the fact that,

> The biggest problem with that is, you can't get it at home. If you're doing lesson
> plans you're stuck at school, trying to find the pieces that you want. You can't even
> get it at another school. It knows if you're in your own school. If you go to another
> school, you can't do that. (Focus Group, 3/3/10)

How do teachers currently integrate technology with literacy instruction and how has this changed over time? There were several themes which emerged as a result of the discussion around teacher integration of technology with literacy instruction. Teachers in this group noted that technology integration supported them in the following ways:

1. Collaborating,

2. Differentiating Instruction,

3. Motivating through constructivism and

4. Embedding real world life skills into the curriculum.

These notions can be illustrated in the discussion following words from the teacher participants.

As teachers plan the integration of technology into the literacy curriculum, they recognized the supportive nature of collaboration with colleagues. Teachers commented in the following ways:

Having the internet and having the ability to find or tap into a resource like that. It doesn't just impact you but can impact the whole school system. The idea of the isolation and building something for my smart board for my classroom and only I get to use it, is disappearing. People can tap   into something that is fabulous and all you have to do is make sure everybody knows about it. That's not a hard thing. You have to learn new language and translate it into something else. It's just, here's the link. I'll send it to you. It opens a door. That becomes one of the newer problems. How do I find the best in a reasonable amount of time so that I can make it work best for kids? You could spend forever hunting trails. That's another issue. When you find the site, I love the fact that everyone is good at sharing that kind of thing. You're not out there struggling all by yourself. That kind of feeling is unique to our building.

Our family reminds me all the time that there aren't too many Portage Paths around.

There's a ton of that in that building. I've chosen to stay there for a long time because

I love that feeling. I cannot say it's not encouraged in other buildings. (Focus Group,

3/3/10)

Technology integration has also encouraged teachers to differentiate instruction

across the literacy curriculum. Specifically, the teachers acknowledged that

That's a handheld hundred dollar computer that thinks with a host computer. There's

software on there for math and for reading and some literacy. The teacher can

prescribe per student. If you have somebody reading at a very low reading level, or

reading at an A, B or C level, you can tune that machine to do work at their level

compared to somebody else who may be at a D or an H, or another reading level.

That came from a grant from Chase. It's not in the whole school system. It's in

maybe four and You set up the skill sets for individual students. It monitors and it can

give you feedback as to how you're doing. (Focus Group, 3/3/10)

Technology also proves to increase motivation as students engage in constructing

their own connections and making meanings through the literacy curriculum. It was noted

that

I like the fact that they're taking ownership. This is their learning. They're helping

each other. They're getting stuff. They're learning the same thing, but they're in

control of how it's going. They're doing the calendar. They're doing the numbers.

It's interactive with them. They're learning how to use new technology. I think it's

fabulous. There's no going back. There's only going forward, adding more pieces

and Everybody gets more excited. They tend to sit closer to each other, so that

everybody is closer to the smart board. The whole feeling of the room   changes

when we do something. (Focus Group, 3/3/10)

Above all, the teacher participants understood the power of technology in the literacy curriculum to frame their students' understanding of real world skills as well as the foundational skills necessary for their technologically enhanced futures. The teacher participants concurred that

One factor is feeling responsible, to have the children as successful as possible. Not so much for their own school, but for their own life. One of the things that you said, when you're talking about technology, we are preparing our students for a world that's totally different from the world that we grew up in. Technology is part of that world. The more technology that we can have in their world, helping them use it appropriately, helping them search for information, helping them know how to find things, how to utilize their skills, the better prepared they will be. Their world will never be even the way it is now. Think how much it's changed in five years. Five years from now, it will be completely different. They will always have this. We grew into this. We didn't have this and I was talking to someone the other day. The sad thing of it is, see that computer over on that table? You can put this down and the computer. Which one do you think the kids going to go for? That's their generation. This is their time, the computer. It's not the thing that we have in our classrooms that we think is WOW. It's not. If we can get them to that path, it's like this. It's all over. How awesome can you be? They can do their writing on it and print right off of it. All you need is one computer in the classroom to print off of. It is what it is. We hold them back. We talk about this all the time. We're gate keepers. I think we hold them back and don't mean to. You just don't have the resources available at this point. (Focus Group, 3/3/10)

Where and how do teachers acquire the information needed to support their

successful integration of technology with literacy instruction? There were three

constructions that emerged from the data set informing this research question. It was evident

that the teacher participants delineated their acquisition of professional development on three

distinct levels which included at the district, school, and individual teacher level.

The teacher participants shared that the district had established a framework which

allowed for sharing and dialogue around selected professional literature. All teachers were

required to participate in this endeavor and were reimbursed for their efforts. The teacher

participants explained that

> . . . the books we did in our book study the first semester, the K-3 writing and the café
>
> for the upper grades . . . neither one of our groups ever really got through the whole
>
> book.. what we talked about doing was expanding those two books and For six hours,
>
> we select a book or two and the teachers put together their own group of people.
>
> They push how they're going to do the books. If we went with café for the upper
>
> grades, K-2 writing for the lower grades, that would all mesh together. You know
>
> you're going to need to do at least six hours for the study group. We went back to the
>
> smart board group, focusing on the literacy component of it, because that's what the
>
> K-2 writing was, and that's what café is. We began to go back to making use of our
>
> technology resources, but taking the literacy, practice in writing that is there for us
>
> now. We worked hard to mesh it together and create that sense of community in them.
>
> I felt, when we moved to the new building, we're all on one floor, and sometimes it
>
> doesn't feel like it. We're spread out. You and I are in our own little world, and then
>
> WAY down there is the other. (Focus Group, 3/3/10)

The strongest asset of this particular group of teacher participants was willingness to share opening with other school colleagues. This is evident in many ways as is illustrated in the following examples:

. . . we would meet and we would just kind of sit and share our ideas about what we did today or how you get into the notebook, how you get to be interactive? What are the steps? We would just sit there and seriously write a note . . . that's what helps me, to actually sit there and watch somebody do it and Multiply that with all the other people around us. If you are at different levels, you have the ability to bounce off each other. You will go to your next level and John will go to his next level and We're so lucky to have each other to get to the next level. I went to a class of beginner smart board. The person that was teaching it couldn't get anything working. Nothing was working. Finally, [an instructor colleague] came to the class, and was expert at it, to learn more about it. She ended up going up in front and suggesting gently. You might want to try that, or let's try this. That's how you learn, by watching it successfully done and Just getting together and sharing the different things. I never would have thought to use the smart board as your circle time until you see that. I thought that was brilliant and . . . said, look at this site and this site. I looked at the sites and picked everything I liked, that I thought would work in my class and just adapted it. I'm forward thinking. This is what I'd like to see my kids do. This is how technology can help in Kindergarten, now how can I get to that point? (Focus Group, 3/3/10)

What was truly inspiring was the vision and motivation that these teacher participants possessed although each in very different ways. The strongest of these is represented in the following teacher comment:

If I could dream it and have everybody do it, one would be twitter. Use twitter as a

way of getting educational people that are sharing their educational things. There are

three or four people who talk. Sometimes, I watch two guys from Britain. I did get a

response from one guy. He'll respond back sometimes, a direct message back to me,

or out to the public. He sent one out just recently about his favorite apps on his I

phone. I started looking at the apps he had. I didn't have that one. It's a free one.

I'll check it. I love it. There's some great stuff. Most of it is free. If I could dream

that it would happen for us, it would be one to start to build on how you use twitter for

educational people. It would get you what people are doing in their classroom and

sharing what they're doing. Then, us starting to share. I found this site. A lot of

times, here's a site that does this. Click that. I tend to look at it later. The other one I

think that's real powerful is finding a few good sites and work that through Google

reader. You're Google reader to go and just give you a quick synopsis of what those

twenty things are. If anything is of any value, that's when you click that one. You're

sifting just the titles and looking at just the titles. A lot of things I found that I've

shared like Wordal. A lot of slideshows. There's 20 ways to use a flip cam or

something like that. That all comes from somebody on a blog saying they're using it

or they're doing that.   For me, that would be the dream come true. People using that.

(Focus Group, 3/3/10)

The discussion of the integration of technology has an historical presence. Even as the

Woods Hole scholars in 1959 contemplated the changing face of education in the post-

Sputnik world, they noted the growth of technology but only in the form of a teaching

machine (Bruner, 1960). The value of these "automatizing devices" was to lighten the

teacher's load by providing programmed immediate correction and feedback to the learner.

Bruner concluded by noting that it was premature to estimate the efficacy of these machines

and he felt that early claims had been greatly exaggerated. The importance of the teacher

remained central to the classroom as Bruner explained:

> Clearly, the machine is not going to replace the teacher – indeed it may create a
>
> demand for more and better teachers . . . nor does it seem likely that machines will
>
> have the effect of dehumanizing learning any more than books dehumanize learning.
>
> (p. 84)

As can be gleaned from the teacher voices in the vignettes shared previously, teachers

are paramount to successful incorporation of technology in meaningful ways and fostering

their continued development is essential for the literacy futures and lives of this nation's

current and future youth. In closing, the following teacher comment represents its

significance:

> When I have my smart board in front of the class, and when I had my Elmo in front of
>
> the class, I think I'm going to be able to use them more. I think you do arrange your
>
> classroom around the things that are most effective. I think you become a more
>
> effective teacher. I think I'll do a better job next year than I am right now. I'm
>
> looking forward to that, taking a step up from where I am now. (Focus Group, 3/3/10)

Discussion of Future Implications

Researchers in this study began their quest with the mission of investigating where

primary grade teachers might find support for the meaningful integration of technology into

their literacy curriculum. They pursued this research path through four phases utilizing a

variety of methodologies to inform the research questions which explored this topic from

various perspectives. Together the conclusions resulting from each of the phases illuminates

a picture of current research and practice centered on the topic of technology integration in

the early childhood classroom to support and enhance meaningful literacy instruction.

Leu (2000) reminds us that the nature of literacy is continually changing and being re-defined as he has coined the term "deixis" to describe this phenomenon. As Leu has also observed, the deictic nature of literacy has profound implications as we consider research which ultimately informs literacy practices. Thus, we are led to question if our existing research methodologies are able to capture the significant components of literacy teaching in the technological 21st century.

The review of literature conducted by the authors of this paper demonstrates that at present, the U.S. Department of Education values scientifically based research studies to provide exemplary models of instruction. The authors believe that the following potential questions may help guide this critical area of concern. Where will this conversation happen? Are research journals the most effective modes of transmitting information on a subject that is continually changing? Do we as researchers also need to employ formative evaluations through the use of technology? Can the government open lines of communication between willing educators to digitally explore these crucial issues and offer insights from their classrooms? Do we need to train every teacher as a researcher? These questions may provide an avenue for exploration as we begin to discuss future lines of research from this area of inquiry.

Through the current research investigations it was found that teachers most likely to integrate technology in skillful ways along with a literacy focus are also likely to be highly adept in their uses of the technological tools available to them. What this suggests is that looking more closely at the experiences of teachers integrating technology successfully would be useful. This also may be a viable path to offering the necessary scaffolding in an effort to design and facilitate meaningful professional development opportunities for those teachers wishing to learn how to integrate technology in effective and meaningful ways.

In-service teachers must expand their mission of preparing children for their futures by keeping a mindful eye on the new demands still unimagined in the professions and workplaces of tomorrow. This necessitates the preparation of in-service teachers to integrate new technologies in meaningful ways in their classrooms. Therefore, our direction must turn to improving the relevancy and purpose of professional development. That is to say, at every level from the classroom teacher to the college professor, the topics for professional development need to be applicable to this new technological classroom and relevant to the individual practitioners' developmental level. Moreover, professional development should be presented in such a way that educators at all levels will be motivated to gain the confidence and access the technological tools that currently are, or will be present in their future classrooms. With this in mind the researchers are led to questions regarding the current nature of professional meetings. Is the conference environment conducive to demonstration of 21st century technology skills? Are technology-related sessions focused on the continuum of learners from early childhood to adult?

Slowly, we are beginning to see "online" digitized workshops transmitted to teachers as models of effective classroom practice. Conversations with practicing classroom teachers suggest that they are taking ownership of their own professional development in this critical area. At present, they are forging professional relationship both "in person" and in cyberspace and are using the Internet as a viable source for enhancing their classroom practice as related to technology integration with literacy instruction. Consequently, researchers also need to understand and embrace this new venue for their sharing professional dialogue.

As we all, classroom teachers and researchers alike pass our specific intellect across the table, the menu of possibilities for the early childhood student will be expanded to include new solutions and those focused to embrace more appropriate resolutions. In closing, the

authors strongly encourage that research of this nature be given a new stage; one that will

allow for an intellectual dynamism whereby all stakeholders, teachers and researchers alike,

will have a voice that is heard.

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