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AUTHOR	Pratt, David
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ABSTRACT

Understanding teachers' purposes for having their students use the World Wide Web may help explain why the Internet has not currently reached its full potential as a learning tool in schools. This study explores the various types of purposes teachers have for using the Internet with their students and examines the role of teachers' confidence related to such use.Interview data analysis of 23 4-8th grade teachers who currently use the Internet reveal that they vary in the types of purposes they have for using the Internet as well as in the confidence they have related to that use. A teacher's confidence or a belief in one's ability to do something is commonly referred to in research literature as self-efficacy. This study claims that a certain form of self-efficacy, Internet Teaching Efficacy, is associated with the purposes one has for use with their students. Specifically, while lower Internet Teaching Efficacy teachers reported statements regarding the use of the World Wide Web to promote lower level thinking skills and its basic use, higher Internet Teaching Efficacy teachers tended to incorporate broader purposes including autonomous learning and higher level thinking skills in their descriptions of purpose. Implications for the preparation of current and future teachers are discussed in light of these results. (Contains 32 references, 8 figures, and 2 tables.) (Author)

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Understanding the Role of Self-Efficacy in Teachers' Purposes for Using the Internet with Students

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David Pratt
University of California, Santa Barbara
dpratt@education.ucsb.edu

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Abstract

Understanding teachers' purposes for having their students use the World Wide Web may help explain why the Internet has not currently reached its full potential as a learning tool in schools. This study explores the various types of purposes teachers have for using the Internet with their students and examines the role of teachers' confidence related to such use. Interview data analysis of 23 4-8th grade teachers who currently use the Internet reveal that they vary in the types of purposes they have for using the Internet as well as in the confidence they have related to that use. A teacher's confidence or a belief in one's ability to do something is commonly referred to in research literature as self-efficacy. The present study claims that a certain form of self-efficacy, Internet Teaching Efficacy, is associated with the purposes one has for use with their students. Specifically, while lower Internet Teaching Efficacy teachers reported statements regarding the use of the World Wide Web to promote lower level thinking skills and its basic use, higher Internet Teaching Efficacy teachers tended to incorporate broader purposes including autonomous learning and higher level thinking skills in their descriptions of purpose. Implications for the preparation of current and future teachers will be discussed in light of these results.

Keywords:

Self-Efficacy, Teacher Efficacy, Internet, World Wide Web, Beliefs, Technology, Educational Purposes.

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Billions of dollars have been spent in recent years to assure that schools are connected to the vast resource of the World Wide Web (Ballard, 2000). This appears to be an important resource for students, as many researchers have noted its potential to challenge users to use higher levels of thinking and help prepare students for the Knowledge Age (Doherty, 1998; Maddux, 1998). According to one report, the number of computers in schools has increased over 15% each year during the last decade (Anderson & Ronkkvist, 1999). Whereas ten years ago the computer to student ratio was one to nineteen, a 1998 survey found the ratio to be one computer for every six students.

As part of the growing use of technologies, access to the Internet has recently become a resource rapidly being incorporated into schools. Recent national surveys suggest that 99% of American schools have some kind of access to the Internet (QED Report, 2000; FRSS, 1999). Researchers have characterized the nature of this inclusion of new technology, particularly the use of the Internet, as being more conducive to individualized, inquiry based learning (e.g. Love & McVey, 2000). However, the influx of computers in schools does not necessarily assure their appropriate use by teachers, students, or for that matter, any use at all. While the problems associated with the availability of computers connected to the Internet have decreased, other problems have begun to surface and many agree that the effect of technology on student learning have yet to be realized (Maddux,1998; Becker, 1999; Cuban, 2001).

Recent research has made it clear that, in order to understand the impact of technology on students, one must consider more than simply the ratio of students to computers. Researchers are now asking more specific questions about how and to what purposes technology is being used.

Since it is the teacher who controls most of the learning that goes on in classrooms, researchers have recently focused on how teachers implement the use of computers and the Internet. Unfortunately, such use by teachers' with students appears to be limited. While 99% of schools have access to the Internet, a recent study showed that only 13% of teachers had required students to use a browser in ten or more lessons during the year (Williams, 2000). Becker's (1999) national survey of teachers' use of the Internet found that 68% of teachers with Internet access have searched the web to find resources to help them with the planning and implementation of lessons. He found that far fewer teachers, however, encourage students' use of the Internet as part of their instruction. Less than half of the teachers who had Internet access in their classrooms had their students use the web as a research tool on at least three occasions during the year.

Further, when teachers actually use the Internet with their students, the purpose of such use does not always reflect broader educational goals. In fact, most research mirrors that of Cuban's in finding that the use of technology has been primarily for traditional purposes or in ways that focus on basic skills. He points out, that regardless of the abundant availability of computers, software, and professional development in schools, this has not led to frequent or extensive teacher use of technologies for tradition-altering classroom instruction (Cuban, 2001).

In light of this apparent underuse by teachers of the Internet, attention has turned to the education of teachers. It was thought that teachers who became more proficient in their knowledge of computers, would naturally increase their use of computers with students. Many schools and districts have chosen to focus inservice opportunities for their teachers on computer workshops. Still, problems persist with getting teachers, even those who are

prepared, to use technology consistently as part of the curriculum. Even when the teachers are prepared well, there still exists a lag in interactive computer use into classroom teaching.

METHODOLOGY

Purpose for Study

This study focuses on answering the following research questions: 1) What kind of educational purposes do teachers have for using the Internet with their students? 2) What is the nature of the association, if any, between teachers' confidence for using the Internet with students (Internet Teaching Efficacy) and their purposes for using the World Wide Web with their students?

Respondent Selection

Participants were selected using an established instrument for measuring one's Internet Teaching Efficacy (see Appendix A). The Personal Internet Efficacy Beliefs Scale (PITEBS) was developed by Koul & Rubba (1999), as described earlier, was chosen to measure each teacher's ITE for two reasons. First, it measures specifically the use of the Internet as a tool used in the classroom with students. This was important, since most other efficacy measurements assess confidence with teachers' ability to use the computer (irrespective of their belief in their ability to apply the skill or knowledge with students). Secondly, the PITEBS had been tested on at least one population with successful validity and reliability conclusions (Koul & Rubba, 1999).

Grade level taught was also important when selecting respondents. It was determined that only those that taught 4-8th grade would be included in the final selection. Finally, only those teachers that taught a minimum of two lessons using the Internet with students were considered.

Following these decision rules, 22 teachers were selected from local schools to be participants for the present study. The respondents represented five different grade levels and eight different schools. Teachers also represented a wide range of teaching experience. While one teacher only had two years of experience, the greatest amount of experience was 34. The total number of respondents averaged 14.1 years of teaching. Table 1 presents these participants by school, grade level, years taught, and ITE score. (Note: All teachers and school names are fictitious).

Table 1

Summary of Participants Selected for Study

Name	School	Grade	Year	ITE Score
		Higher ITE Teachers		
Mary	Adams	5	25	5.85
Jenny	Hoover	4	18	5.69
Karen	Hoover	6	15	5.69
Lynne	Hoover	5	2	5.23
Kris	Adams	5	18	5.15
Haley	Madison	6	4	5.00
Alice	Harding Jr. High	7/8	6	4.54
Marta	Pine	6	6	4.46
Sammy	Hoover	5	15	4.38
Cathy	Hoover	6	19	4.31
Colleen	Columbia Jr. High	7/8	7	4.00
		Lower ITE Teachers		
Michelle	Adams	4	9	4.00
Monica	Monroe Jr. High	7/8	10	3.92
Chris	Adams	5	8	3.85
Elizabeth	Columbia Jr. High	7/8	6	3.69
Candy	Kennedy	4	6	3.38
Susan	Hoover	4	10	3.31
Caroline	Pine	6	34	3.23
Myra	Columbia Jr. High	7/8	12	2.85
Jamie	Madison	4	27	2.81
Donna	Columbia Jr. High	7/8	25	2.54
Summer	McManus Middle	6	20	2.31

To assist in later analysis of the Respondents, their position in Table 1 was determined by the rank order of their ITE scores. Those teachers belonging to the lower half of the ranking are referred to as having "lower ITE" rather than low ITE. While those with scores below the median may represent scores that are low relative to this group, they may not represent an absolute low level of confidence. Interview data, however, did appear to support the notion that teachers who had mean scores less than 4.0 did not express confidence about their ability to teach when using the Internet. For example, Jamie, a 4th grade teacher, who had an ITE score of 2.81 suggested that she wasn't very confident and volunteered that her level of confidence was a 2 on a scale from 1-10. Therefore, for future analysis, teachers will be labeled as "lower ITE" or "higher ITE" teachers.

Interview Coding Procedure

An established coding procedure developed by Copeland & Caston (1994,1998) was used to categorize purpose statements as "broad" or "narrow" (Appendix C). Narrow purposes included concern with Pupil Comportment, Pupil Participation, Follow Directions, and Lower Cognitive Thinking. Broad purposes included a concern for Higher Cognitive Thinking, Affective Thought, and Autonomous Learning. The focus of the present study is primarily on understanding differences displayed among respondents regarding their ratio of broad purpose statements to the narrow purpose statements among teachers.

RESULTS

Teachers' General Use of the Web with Students

The 22 participants selected for the study provided a range of ITE scores and purposes for using the Internet. While respondents differed in the purposes they had for the use of the Internet, all of their descriptions of use are based on students gaining access to web

sites containing information and then dealing with that information. All participants also mentioned using the Internet as an extension of the traditional curriculum of their classroom. Liz's description in the following paragraph is a typical example of this type of use. She described the former use of the library with books recently expanding to include the use of new technologies.

> "It's probably one of the few places I could figure out where to stick the Internet in my curriculum where it made sense. It makes sense as we're using it as a source of information. It makes sense that we're in the library anyway, the computers are there, the books are there, even if they're not enough computers that day the kids can go to books." (Liz, p. 2).

Most Respondents reported this type of integration of the Internet with ongoing curriculum because they lack the time to cover the quantity of material they must cover. Cathy echoed the statements of several other teachers when she reported that, because of the time pressures, one <u>must</u> integrate it with the other curriculum (Cathy, Interview #1, p. 4).

Even though participants viewed the Internet as a source of information similar to that of books or newspapers, they also mentioned several benefits to using the Internet with their students. More specifically, the Internet provided information that was 1) more in amount of information 2) more easily accessible 3) important for future schooling and jobs, and 4) helpful in enhancing motivation

Modifying sub-categories of purpose statements

Though similarities regarding the general use of the Internet were found through the respondents' statements, a more focused analysis revealed a considerable variation in expressions of educational purpose. Before detailing these differences, the original categories based on Copeland & D'Emidio-Caston's (1998) study was modified to fit the present study's data. The original coding procedure was based on statements made by

teachers after observing a reading lesson. The current Respondent's descriptions of their own teaching using the Internet appear to have elicited additional and distinct purposes unrelated to the existing categories. Examples of the data in the present study resulted in the addition of one sub-category to accommodate responses that dealt specifically with the use of the Internet. That sub-category was labeled "Following Directions".

While some teachers had broad goals that allowed students to learn on their own (autonomous learning #9), others mentioned a narrow purpose which included the notion that students should only be allowed access to very specific sites and information that the teacher thought was valuable. This was labeled as sub-category "Following Directions". It included a concern regarding students' tendency to get lost or to stray from sites and information the teacher wanted them to examine. This sub-category is classified as "narrow" since it represents a teacher's concern for students to focus on specific teacher-controlled information (Appendix C). This was thought to be distinct from the existing "pupil comportment" sub-category since the focus was not so much on physical as on cognitive behavior.

A clear example of a teacher having a purpose statement categorized as "following directions" was Monica. When responding to what was important for students to get out the lesson, she mentioned, "a big part of it is following directions. They're given specific rubrics and told that they need to do exactly what is asked of them" (Monica, p. 1). Another example of a teacher's concern with a student following directions was when Karen described the purposes for her lesson:"...and when I give them assignments, it is a line by line assignment telling them exactly where to go and what they should be getting out of it." (Karen, p. 3)

Teachers' Specific Purposes Regarding the Use of the Internet with Students

Now that the general trends about teachers' use have been reviewed and the purpose statement sub-categories refined, one can examine in greater detail the purposes these Respondents' possessed. The analysis of data from the first interview revealed a total of 202 purpose statements related to student learning produced by the twenty-two teachers. The smallest number of statements for any teacher was six while the largest was 13. The Respondents averaged nearly 11 purpose statements per teacher. Table 2 provides a summary of these data.

Table 2

Respondents' ITE Scores, Number of Purpose Statements by Type, and Resulting Broadness Scores

Respondent Name	ITE Score	Purpose Statements: Narrow 1	2	3	4	Total	Broad 5	6	7	Total	Broadness Score
Higher ITE Teachers											
Mary	5.85	0	0	0	3	3	2	1	0	3	.50
Jenny	5.69	0	0	0	4	4	2	1	0	3	.43
Karen	5.69	0	2	2	2	6	2	3	2	7	.46
Lynne	5.23	0	0	0	3	3	1	4	1	6	.67
Kris	5.15	0	1	0	2	3	4	2	0	6	.67
Haley	5.00	0	1	0	4	5	1	3	0	4	.44
Alice	4.54	1	0	1	3	5	3	0	1	4	.44
Marta	4.46	0	2	0	2	4	2	1	1	4	.44
Sammy	4.38	0	0	0	3	3	2	3	2	7	.70
Cathy	4.31	0	0	0	3	3	2	4	1	7	.70
Colleen	4.00	0	0	0	6	6	1	2	1	4	.40
Lower ITE Teachers											
Michelle	4.00	0	1	0	3	4	0	2	0	2	.33
Monica	3.92	0	1	3	1	5	3	1	0	4	.40
Chris	3.85	0	0	1	7	8	0	2	0	2	.20
Elizabeth	3.69	0	1	0	7	8	2	1	0	3	.30
Candy	3.38	1	0	1	4	6	2	0	1	3	.33
Susan	3.31	0	0	1	6	7	0	1	0	1	.13
Caroline	3.23	0	2	1	5	8	2	0	0	2	.20
Myra	2.85	1	0	1	3	5	1	0	0	1	.17
Jamie	2.81	0	3	0	5	8	0	3	0	3	.27
Donna	2.54	0	0	1	7	8	1	1	0	2	.20
Summer	2.31	0	2	1	5	8	1	1	0	2	.20

1 = Pupil comportment; 2 = Pupil Participation 3 = Following Directions 4 = Lower Cognitive Thinking
5 = Higher Level Thinking 6 = Affective Thought 7 = Autonomous Learning

Examples of Purpose Statements

It was clear that teachers had different purposes for why they wanted students to use the Internet. Many of them were direct statements regarding purposes and coded with the newly modified categories. These direct statements of purpose tended to come in response to the interview question, "What were some of your purposes for this lesson?" Figure 1 presents two broad and two narrow examples of such direct purpose statements.

Examples of Direct Broad Purposes

"I just think they need to be critical thinkers. They need to be people who can gather information but can process it into something new." –Colleen, p. 3

"...you give them instruction about how to judge what information they're looking up. How to search..how to judge the material and how to organize it and how to use it." –Mary, p. 3

Examples of Direct Narrow Purposes

"Just being able to access the Internet which most of my students don't have that opportunity in their own home." –Michelle, p. 4

"To gather information about aspects of the culture" --Jamie, p. 5

Figure 1. **Examples of Broad and Narrow Purposes**

Use of Additional Indicators

The interview used additional questions to ask about the lesson other than direct questions about purpose. Recall that the analysis of the present study's sample was modeled after Copeland & D'Emidio-Caston's (1998). In it, they interpreted participants' direct statements as well as indirect indicators regarding purposes by using a specific coding procedure (see Appendix D). According to the authors of that study, this approach of considering indirect indicators was valuable in that it reduced the chance that participants would parrot the answer they thought the researchers wanted to hear or what they assumed be the "right" purposes.

The present study was designed so that many questions and probes were used to gather additional information regarding indirect Indicators. These indirect Indicators used by Copeland and D'Emidio-Caston (1998) defined expressions into categories labeled Guiding Principles, Practical Generalizations, Suggested Changes, Theory Links, Value Judgments, and Action Links. Once an expression in a Respondent is identified as being one of these indicators, it can be classified as representing one of the types of educational purposes described above. Of the 202 purpose statements that were identified in the interviews, 114 were identified as being direct statements of purpose. The remaining 88 were identified as being indirect purpose statements associated with these 6 indicators.

Teachers' Purpose Statements. All 202 student-oriented purpose statements (direct and indirect) were coded using the sub-categories found in Appendix C. Recall that there are two major types of purpose statements: narrow and broad. Table 2 also presents the notion of purpose statements made by each Respondent, classified as belonging to each sub-category and whether that category is broad or narrow.

Correlation between ITE and Purposes.

First, a scatterplot (see Figure 4) was created to visually examine the association between each Respondent's ITE and Broadness scores that were presented in Table 2. It appeared from the scatterplot, that in general, there tended to be a relationship between the confidence participants expressed in using the Internet and their purposes for using it. More specifically, as Respondent's grew in confidence with Internet use, they tended to include a broader percentage of broad purposes related to total number of purposes. There also appears to be greater variation among scores as the ITE and broadness scores increase. As

predicted by examining the scatter-plot, a correlation between these two sets of scores was calculated using SPSS to be significant at the .01 level (r=.817).

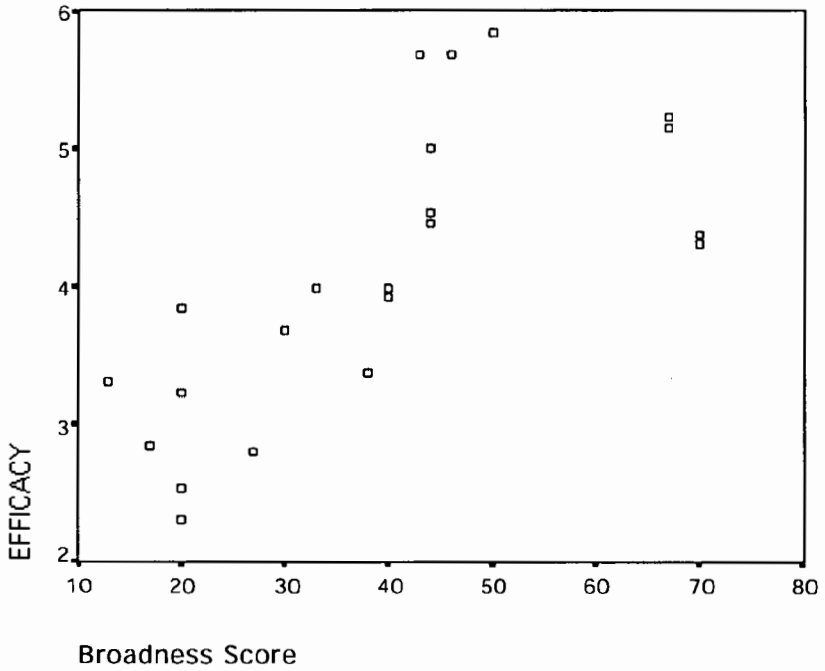

Figure 4. Scatter plot of Participants' Efficacy Scores and Broadness Scores

While a significant correlation between ITE and purposes is an important finding, one can examine in more detail the nature of such an association. In order to accomplish this, the participants were separated into two groups by rank order according to their Broadness Score and dividing them at the median. The two groups were then compared with regards to the number of purpose statements for each. This helped reveal where the greatest discrepancies in categories existed. Figure 2 depicts the difference between higher and lower ITE teachers for the narrow purpose sub-categories. Notice that in each of the narrow purpose sub-categories, there were a greater number of statements provided by teachers with lower ITE than the higher ITE group. The largest difference was evidenced by the sub-category

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"Following Directions". While ten statements were made by those teachers with higher ITE (n=8), only 3 were made by those with higher ITE (n=2). (Note: The number of participants making such statements is represented here in the parentheses so that the reader can know not only the number of statements by all participants in a group, but how many participants in that group made such statements. Recall that each group contained 11 Respondents. A concern for lower level thinking was the most common sub-category mentioned and was also substantially different as 53 statements were produced by lower ITE teachers (n=11) while 35 statements came from the higher ITE group (n=11)

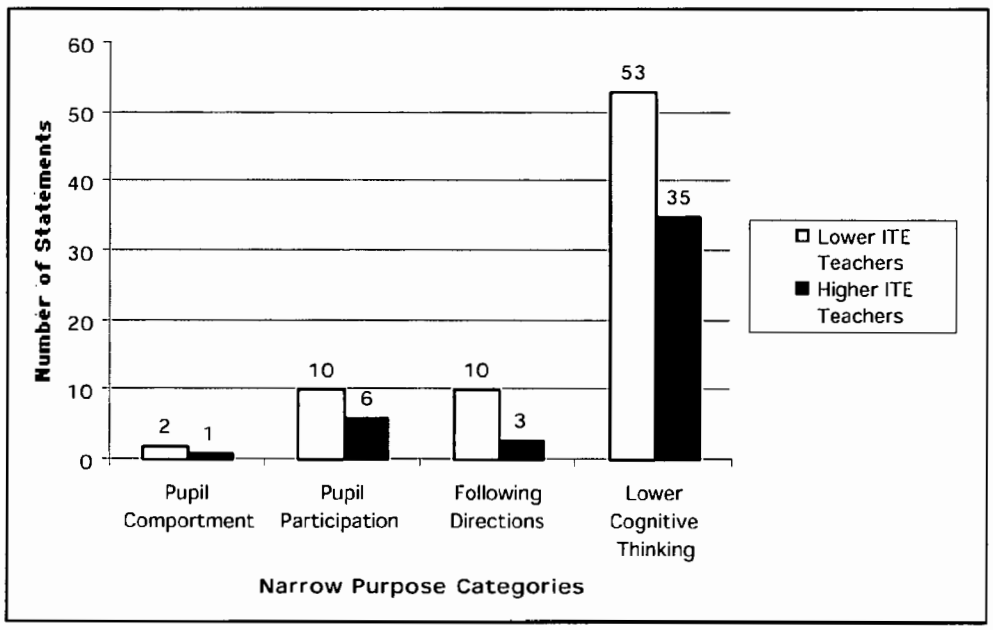

Figure 2. **Narrow Purpose Statements of High and Low ITE Teachers**

In contrast to the previous figure, Figure 3 summarizes the number of statements mentioned by each group for each broad purpose sub-category. Notice that for each broad sub-category, there are more statements provided by the higher ITE teachers than the lower ITE teachers. Specifically, while twelve statements were made regarding the use of higher

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levels of thinking by lower ITE participants (n=7), the higher ITE Respondents mentioned a total of twenty-two statements (n=11). Data also revealed that autonomous learning was mentioned only once (n=1) by a lower ITE Respondent whereas the higher ITE teachers mentioned it a total of nine times (n=7). Finally, there was twice as many statements regarding students' affective thought by the higher ITE teachers (24, n=11) as compared to twelve produced by lower ITE teachers (n=8).

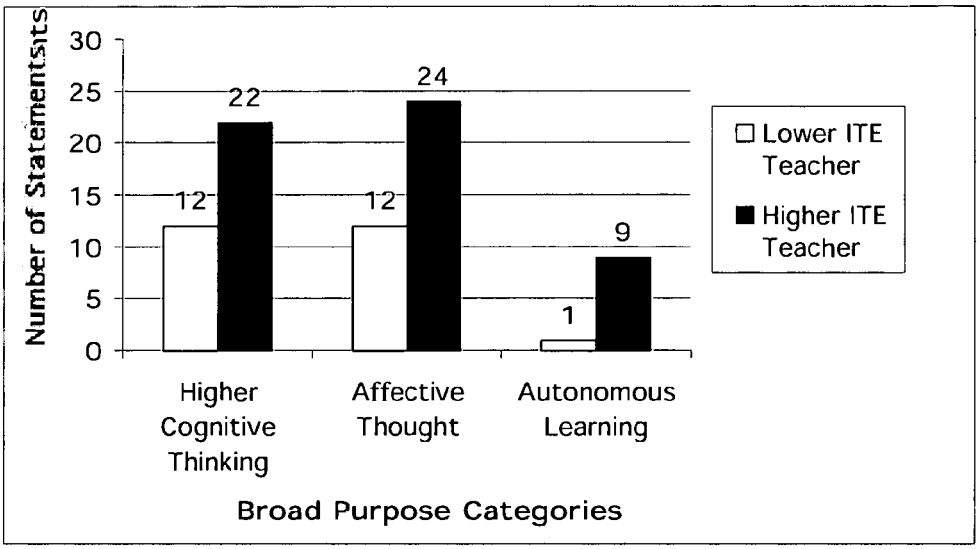

Figure 3. Number of Broad Purpose Statements of High and Low ITE Teachers

Examining Differences Between Groups Among Contrasting Purposes

In addition to examining differences among each separate sub-category, one can examine contrasting sub-categories more closely in order to appreciate the diversity of purposes among groups. It was determined that overall, there were three areas of contrast: use of Cognitive Level of Thinking, Teacher Control, and Affective Concern. Each of these areas included a broad purpose and a narrow purpose sub-category.

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Cognitive Level of Thinking. As mentioned previously, all of the teachers participating in the present study used web sites as a source of information for students to access. The purposes for using the Internet and dealing with information, however, differed dramatically when examining statements between groups. While over 90% of all teachers involved with the study included lower cognitive skills in their descriptions of lessons, it was the broad purposes when compared to the percentage of the total purpose statements that differences can be more clearly recognized. Figure 4 demonstrates that not only did lower ITE Respondents report a larger amount of narrow purpose statements, but that they only mention approximately half of the number of statements related to broad purposes when compared to higher ITE teachers. Specifically, all Respondent's mentioned at least one statement related to Low Cognitive Thinking with lower ITE teachers reporting 53 statements (n=11) and higher ITE participants revealing 35 statements (n=11). There were 12 statements involving High Cognitive Thinking by lower ITE Respondents (n=7) and 22 statements provided by higher ITE teachers (n=11).

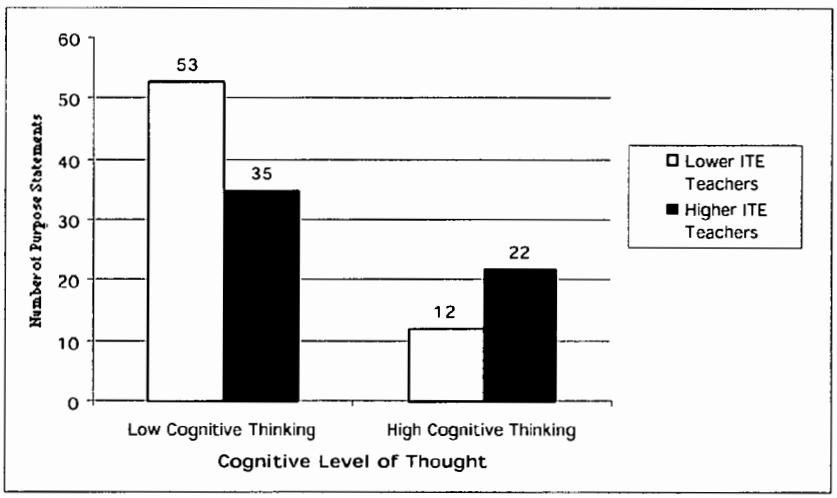

Figure 4. **Differences of Lower and Higher ITE Respondents for Cognitive Thinking**

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Among participants' reflections about Low Cognitive Thinking were statements related to the students' use of the World Wide Web to access information. These descriptions mainly focused on students' ability to operate the basic functions of the web (i.e. open a browser, navigate the web, access information that has been book-marked or saved as favorites). Since the basic use of the Internet typically involves the use of lower cognitive skills, this sub-category was placed under the "narrow" purpose domain of Lower Cognitive Thinking. Examples of statements regarding the use of the World Wide Web as a tool as categorized as a narrow purpose are listed in Figure 5.

"One would be that actually they're on computers and they're learning how to use the Internet, navigating through." (Haley, p. 1).
"How to access the Internet and get around a site." (Cathy, p. 2)
"One was getting them to practice exporting or importing pictures." (Lynne, p. 1)

Figure 5. **Examples of Basic Use of Learning Tool**

While higher ITE participants included students' basic use of the web, they also typically reported the importance of using the Internet to support higher level thinking. Many times they mentioned the importance for students to understand "how" to search by using appropriate terms or selecting which information would fit a particular topic. Additionally, the notion of information literacy was included in the purpose statements of several higher ITE Respondents. Consider Karen's description of using the Internet as a source of information. This sixth grade teacher wanted to make sure that her students were able to discriminate the information that they were inquiring about.

> "there is a whole discussion about what is out there and why will you read something one way and you might read another fact over here. Again...history, if you are doing something on Rome and the web site says this is what happened and another one says this is what happened...who is right? Why are they different? And that's why I like teaching 6th grade

> because you can really discuss something like that and talk about how people misinterpret information and perpetrate them on these web sites. I think that's a really important thing for kids at my grade level to get out of the Internet."

In contrast a lower ITE teacher named Donna could not envision her students learning how to decide what information is of value. Instead, she believed she should have to take that role for them. She mentioned that "... hopefully either Linda (lab consultant) or I have had a chance to look at it and go 'well that's not really what you want or this is written for scientist we need to find something written for students'". Later Donna described more specifically why she routinely bookmarks all of the sites the students have access to in order to only let them only use the "good" ones. Figure 6 highlights two more descriptions of using the Internet to support broad purposes.

> "I think that it's important for them to show the difference between primary and secondary sources, maybe to be able to tell the difference between one that is really factual and another that is just Mr. Kingsley's 5th grade social studies class." (Monica, p. 3).
>
> "Because they may get to somebody's web site and they're just kids like they are putting stuff that they think they know but they don't really know. So they (students) have to know who are their sources and where is it coming from. And once they've learned that information then they can decide okay this is something I want to teach my students, the other fellow students, or not." (Alice, p. 2)

Figure 6. **Examples of Use of Learning Tool for Higher-Order Thinking**

There are several examples of teachers using both higher and lower cognitive purposes in the same lesson. Sammy, a higher ITE teacher in 5th grade, described the purposes for her lesson as having students answer different types of questions based on the information they find. Some were comprehension questions such as "where was Martin Luther King's 'I Have a Dream Speech' and how many people in attendance?" (narrow) while others were based on inferencing skills such as 'How would you feel if you had been

there and what was the outcome of the speech?' In contrast to this, many of the lower efficacy teachers did not incorporate the use of these broad purposes.

Teachers with lower ITE may have recognized the need for higher cognitive purposes, but appeared to be limited in their ability to implement them. Colleen addresses this type of cognitive dissonance resulting from a workshop that she attended.

> "...and I don't feel like I use it enough or even in ways that could necessarily be the best. I think the Bernie Dodge workshop was a good one for me to realize that they should be doing more sophisticated tasks than just gathering facts. I think I've used the Internet mainly to gather facts like they would out of a book. Instead of gathering facts to come to a new conclusion or to make a project or something like this."

Control: Student vs. Teacher. The issue of control revealed distinctive differences when considering responses to the contrasting sub-categories of "Following Directions" and "Autonomous Learning". Figure 7 clearly displays the descriptive distinctions between them. While higher ITE teachers included only 3 "Following Direction" statements (n=2), they mentioned 9 statements related to autonomous learning (n=7). In contrast to that, lower ITE Respondents mentioned 10 following direction statements (n= 8) and only one related to autonomous learning (n=1). These teachers with lower ITE described the desire to control the information they wanted students to access. They did this when only providing one bookmark to examine and restricting students' ability to explore on their own. They also limited the way in which students interacted with the information by having them respond to specific information in specific ways. (i.e. treasure hunt). Higher ITE teachers mention the willingness to turn the control at least partially to students when they say things like, ""So basically I've gone from..."OK here is one site...you fill in a worksheet" to "OK...here is a site that has all of these connections...research it." (Kris, p. 4)

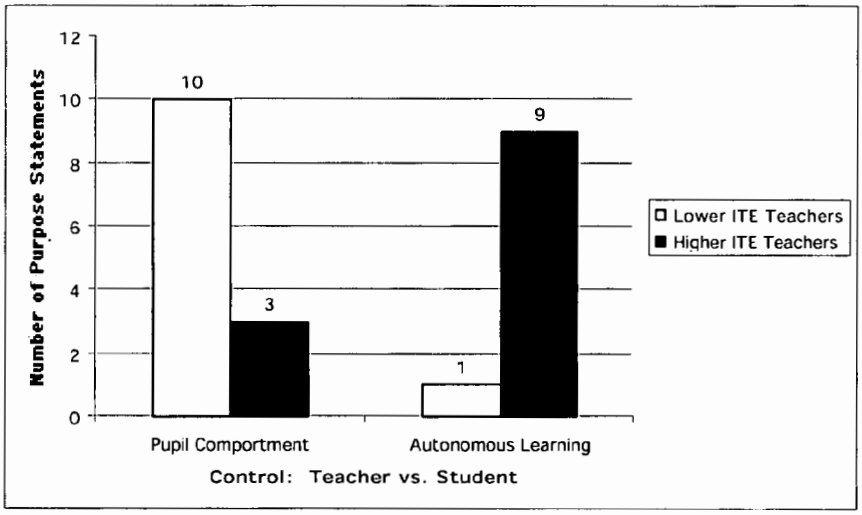

Figure 7. **Differences of Lower and Higher ITE Respondents Regarding Control**

Many of the higher ITE teachers mentioned the need to have a balanced approach. They generally provided their students with some initial structure, and then eventually moved into giving more autonomy over time. Cathy described this process as taking place over the course of the year.

> "So, at the beginning of the year, we are just saying, 'type in this URL, here are the questions'. And we try to get a little bit more open ended as the year goes on. So that they are to try to problem solve, "what kind of search engine should I use, What should I type in, as to what would access this information. Woah, I've got a thousand sites, how can I narrow that down. So we are trying to get them as independent as we can." (Cathy, p. 5)

Concern about Students. Finally the sub-categories involving Affective concerns and those that are not focused on Affective concerns (such as pupil comportment) can be compared and used for further understanding. Figure 8 displays the difference between participants with lower ITE and higher ITE. In the case of affective concerns, there were twice as many statements given by the higher ITE teachers than the low. There were also twice as many statements among lower ITE teachers regarding a focus on students behaving

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themselves when compared to higher ITE teachers (although it was only a difference of 2 to 1).

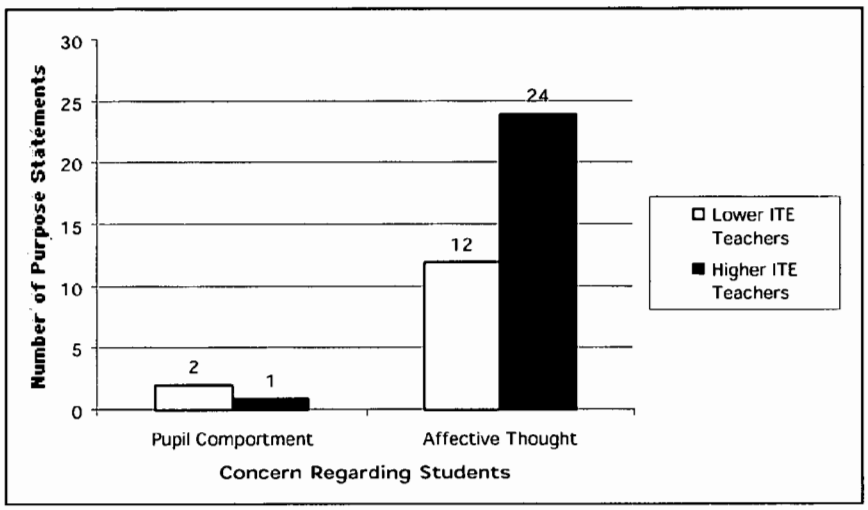

Figure 8. **Differences of Lower and Higher ITE Respondents in Concern for Students**

DISCUSSION

Understanding the relationship that exists between teachers' Internet Teaching Efficacy and thier purposes for using the Internet with their students makes several contributions to both the theoretical underpinnings of the current research base, as well as to practical implications involving inservice and preservice teaching programs. Consideration of the purposes teachers have for the use of the Internet is important not only to realizing the potential of schools' investment related to technology, but to realizing the potential this technology has for helping prepare students to become literate in the Knowledge Age.

The Cost and Potential

Considering the cost of having Internet-compatible computers suggests that their use should be greater than for drill and practice. Billions of dollars are being spent to ensure that computers and Internet access become more and more available to students. According to

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one report, $5.4 billion was spent on computers and related infrastructure in 1999 (Ballard, 2000). The federal government estimates another $5-10 billion per year as the cost for maintaining and improving those infrastructures.

Other than considering the cost involved with such a resource, many agree that teachers should employ methods to increase the use of technology as a tool to support higher order thinking skills with their students. Some researchers suggest that teachers should use Bloom's taxonomy as a template for writing questions to ensure that diversity of questions and critical thinking are involved (e.g. Callison, 1998; Gilbert, 1992). Several studies specifically state the importance of higher level thinking as a necessity for survival in a rapidly changing world (Lee & Dinkins, 1998; Paul et. al., 1990). These studies support the notion of including higher level or broad purposes among the existing low/ narrow purposes of teachers: although they do not generally state to what degree they should be employed. The present findings suggest the possibility that modifying teachers Internet Teaching Efficacy may enable teachers to more carefully consider and adopt higher educational purposes for their students Internet use.

Teacher Education Issues

It is important to determine whether one should specifically consider addressing self-efficacy in the preparation of teachers. If the purpose for using technology by teachers differs not just on effectiveness of skill but of efficacy, then one would assume that, along with proficiency workshops, support for specifically increasing one's computer or Internet efficacy might be necessary. An understanding of the sources contributing to the efficacy of Internet use among teachers and their students may be even more helpful. For example, knowing that vicarious experience (modeling) is the most common way teachers increase

their self-efficacy, one could focus on providing good examples of teachers using technology in order to increase their self-efficacy. Some recent studies have undertaken this type of examination of sources of influence related to efficacy. For example, Zeldin & Pajares (2000) used semi-structured interviews to help understand the efficacy sources of women in mathematical and science-related careers. They asked specifically about each source of efficacy information and determined that verbal persuasion (feedback) and vicarious experience (modeling) were the most influential sources. Future research needs to be done related to such sources of efficacy for using the Internet with students.

Program Implications

Teacher education programs may need to consider that providing a strong knowledge base of content and pedagogy may not be sufficient to help teachers grow and succeed as professionals. Many researchers suggest that teacher education programs should be revised to incorporate this notion of explicitly acknowledging the beliefs teachers bring with them to a program (Ashton & Webb, 1986; Hollingsworth, 1989; Ross, 1995). Although not aiming explicitly at developing a teacher education program intervention, the results of this study expands our understanding of the importance of the role teachers' beliefs, specifically the purposes teachers have for using the Internet with students. It is hoped that this new knowledge will help programs appreciate the need for a focus on providing not just skill but opportunities to enhance one's efficacy.

Contribution to Existing Research

While a large number of studies address teacher efficacy and use of technology generically, the majority of the literature does not address self-efficacy as a construct specifically related to the use of the Internet or consideration of the context in which the

technology is being used. This study will add to the research related to self-efficacy by focusing on a specific type of self-efficacy and under a specific and similar context.

The Internet has changed the way people interact with information. No longer is text presented linearly and limited to the physical resources available at a particular place. Students now have access to a plethora of information from all over the world, from different sources, and with the freedom to explore topics based on their interest. The cost of this resource and its potential are tremendous. In trying to understand how learning in schools can better match the requirements associated with those expected of students in the Knowledge Age, it is necessary to begin an exploration into teachers' purposes for using the Internet and identifying the context associated with such use. At a time when standardized testing controls much of what goes on in the classroom, understanding teachers' use of the Internet for higher levels of purpose seems paradoxical, yet intriguing. The present study suggests that by using the framework of self-efficacy theory, the purpose and role for the Internet in the classroom can be better understood. Only then, will teacher preparation programs, inservice developers, policy makers, and administrators be prepared to make better decisions to help teachers with their use.

References

Anderson, R.E. & Ronnkvist, A. (June, 1999). *Teaching, learning, and computing: A national survey report #2*. Center for Research on Information Technology and Organizations. [On-line] Available: http://www.crito.uci.edu/TLC/findings/Internet-Use/startpage.htm.

Armor, D., Conroy-Oseguera, P., Cox, M., King, N., McDonnell, L., Pascal, A., Pauly, E., & Zellman, G. (1976). *Analysis of the school preferred reading programs in selected Los Angeles minority schools* (Rep. No. R-2007-LAUSD). Santa Monica, CA: RAND. (ERIC Document Reproduction Service No. 130 243).

Ashton, P. T. (1984). Teacher efficacy: A motivational paradigm for effective teacher education. *Journal of Teacher Education,* 35, 28-32.

Ashton, P.T., & Webb, R.B. (1986). *Making a difference: Teachers' sense of efficacy and student achievement.* New York: Longman.

Bandura, A. (1997). *Self-efficacy : The exercise of control.* New York: W.H. Freeman.

Becker, H. J. (1999). Internet use by teachers: Conditions of professional use and teacher-directed student use. Teaching, Learning, and Computing: 1998 National Survey Report #1. Center for Research on Information Technology and Organizations. [On-line] Available: http://www.crito.uci.edu/TLC/findings/Internet-Use/startpage.htm.

Copeland, W.D., Birmingham, C., DeMeulle, L., D'Emidio-Caston, M., Natal, D. (1994). Making meaning in classrooms: An investigation of cognitive processes in aspiring teachers, experienced teachers, and their peers. *American Educational Research Journal*, 31, 167-195.

Copeland, W. D., D'Emidio-Caston, M. (1998). Indicators of development of practical theory in pre-service teacher education students. *Teaching and Teacher Education*, 14, 513-534.

Cuban, L. (2001). *Oversold and Underused: Computers in the classroom.* Cambridge: Harvard University Press.

Doherty, A. (1998). The Internet: Destined to become a passive surfing technology? *Educational Technology*, September-October, 61- 63.

FRSS, (1999). *Survey on public school teachers' use of computers and the internet.* U.S. Department of Education, National Center for Education Statistics, Fast Response Survey System.

Ghaith, G., & Yaghi, H. (1997). Relationships among experience, teacher efficacy, and attitudes toward the implementation of instructional innovation. *Teaching and Teacher Education,* 13, 451-458.

Gibson, S., & Dembo, M. H. (1984). Teacher efficacy: A construct validation. *Journal of Educational Psychology,* 76, 569-582..

Hirsch, E.D. (1987). *Cultural literacy.* Boston: Houghton Mifflin.

Jonassen, D.H., Peck, K. L. & Wilson, B.G. (1999). *Learning with technology: A constructivist perspective.* New Jersey: Prentice Hall.

Kliebard, H. M. (1985). *The struggle for the American curriculum.* New York, N.Y.: Routledge.

Koul, R. and Rubba, P. (1999). An analysis of the reliability and validity of personal internet teaching efficacy beliefs scale. *Electronic journal of science education*, [On-line] 4. Available: http://unr.edu/homepage/crowther/ejse/koulrubba.html.

Lee, V., Dedick, R., & Smith, J. (1991). The effect of the social organization of schools on teachers' efficacy and satisfaction. *Sociology of Education*, 64, 190-208.

Love, R. & McVey, M. (2000). Teachers' use of the internet. *Teachers college record.* ID 10538. [On-line]. Available: http://www.tcrecord.org.

Maddux, C.D. (1998). Barriers to the successful use of information technology in education. *Computers in the Schools*, 14, 5-11.

McLaughlin, M.W., & Marsh, D.D. (1978). Staff development and school change. *Teachers College Record*, 80, 70-94.

McMillan, J.H. & Schumacher, S. (1993). *Research in education: A conceptual introduction* (3rd ed.). New York: HarperCollins College.

Olivier, T. A. & Shapiro, F. (1993). Self-efficacy and computers. *Journal of Computer-Based Instruction*, 20, 81-85.

QED Report (2000). Quality Education Data, Inc. as reported in USA Today, 2/28/2000 by Michelle Healy [On-line]. Available: htttp://www.infotoday.com/MMSchools/nov00/ballard.htm#refs

Ross, J.A. (1994). *Beliefs that make a difference: The origins and impacts of teacher efficacy.* Paper presented at the Annual Meeting of the Canadian Association for Curriculum Studies. (ERIC Document Reproduction Service No. ED 379 216).

Ross, J. A. (1995). Strategies for enhancing teachers' beliefs in their effectiveness: Research on a school improvement hypothesis. *Teachers College Record*, 97, 227-251.

Rotter, J.B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs*, 80, 1-28.

Shulman, L. S. (1987). Assessment for teaching: An initiative for the profession. *Phi Delta Kappan*, 69, 38-44.

Tschannen-Moran, M., Hoy, A.W., & Hoy, W.K. (1998). Teacher efficacy: Its meaning and measure. *Review of Educational Research*, 68, 202-248.

Williams, C. (2000). *Internet access in U.S. public schools and classrooms: 1994-1999 (NCES 2000-086).* U.S. Department of Education. Washington, DC: National Center for Education Statistics.

Woolfolk, A. E., Rosoff, B., & Hoy, W.K. (1990). Teachers' sense of efficacy and their beliefs about managing students. *Teaching and Teacher Education,* 6, 137-148.

Zeldin, A.L. & Pajares, F. M. (2000). Against the odds: Self-efficacy beliefs of women in mathematical, scientific, and technological careers. *American Educational Research Journal*, 37, 215-240.

Appendix A. Personal Internet Teaching Efficacy Beliefs Scale

Answer on a scale from Strongly Disagree to Strongly Agree.	**Strongly disagree**	**Moderately disagree**	**Disagree slightly more than agree**	**Agree slightly more than disagree**	**Moderately agree**	**Strongly agree**
I am continually finding better ways to teach with the Internet.	O	O	O	O	O	O
Even when I try very hard, I do not teach as well using the Internet as I teach in other ways.	O	O	O	O	O	O
I know how to teach effectively using the Internet	O	O	O	O	O	O
I am not very effective in monitoring activities that involve using the Internet	O	O	O	O	O	O
I generally teach ineffectively when using the Internet.	O	O	O	O	O	O
I understand how to use the Internet well enough to be effective in teaching with it.	O	O	O	O	O	O
I find it difficult to explain to students how the Internet works.	O	O	O	O	O	O
I am typically unable to answer students' Internet questions.	O	O	O	O	O	O
I wonder if I have the necessary skill to teach using the Internet.	O	O	O	O	O	O
Given a choice, I would not invite the principal to evaluate my teaching when I use the Internet in a lesson.	O	O	O	O	O	O
When teaching using the Internet, I usually welcome student questions.	O	O	O	O	O	O
I don't know what to do to turn students on to using the Internet.	O	O	O	O	O	O
When a student has difficulty understanding how to use the Internet, I am usually at a loss as to how to help the student understand it better.	O	O	O	O	O	O

Appendix B. Interview Questions

I. Background Information (warm-up)

A) How many years have you been teaching?
B) How long have you been at the current site?
C) What grade do you currently teach?

II. Questions regarding conditions that promote/restrict usage/efficacy

A. Access and quality of use to the Internet
1) How many computers that have the Internet do your students have access to? How often do you have access to it?
2) What do you consider as support or a hindrance to your access in using the Internet with students?
3) What is the speed of the Internet connection at the school?

B. Level of support
1) How would you characterize the degree of support from other teachers at your school regarding the use of the Internet?
2) How would you describe the degree of support from the principal?
3) Do you have any other form of support as a teacher to using the Internet?
4) Do you have access to professional development regarding the use of computers/internet?
5) Do you take advantage of those opportunities?

C. Personal factors
1) How long have you been teaching using the Internet?
2) Why do you consider the use of the Internet with students important?
3) How confident are you about your ability to teach using the Internet with your students?
4) What do you think has been the biggest contributor to your level of confidence or lack of confidence when using the Internet with students?

III. Questions regarding the purpose for using the Internet

A. Lesson description
1) Thinking over your last Internet lesson with your students, can you describe that for me?
2) What made you decide to use the Internet with your students for this particular lesson?
3) What was the reason you wanted to have that type of lesson?

B. Direct questions regarding purpose
1) What were your main purposes for the students in that lesson?
2) Were there any other goals that you did not mention?
3) Was that typical of the other lessons you taught (or ask about another lesson)?
4) Why do you feel these goals are important to you or your students?
5) How successful do you feel about having reached these goals?
6) How would you change the purposes for this lesson if you were to do it again?

Appendix C. Categories of Purpose Statements

I. Pupil-Oriented Purposes

Narrower Purposes - Those Related to Pupil Behavior and Lower Cognitive Thought

Sub-Category 1. Pupil Comportment
Concern for how students are "behaving themselves" in the classroom. Includes such things as off-task behavior, paying attention, fidgeting, moving about without permission and sitting quietly.

Sub-Category 2. Pupil Participation in the Lesson
Concern for the manner and patterns of student involvement in the publicly experienced classroom conversation. Includes patterns of obtaining opportunities to speak, factors that encourage or inhibit involvement and patterns of involvement which are apparently governed by factors such as gender, race or physical location.

**Sub-Category 3. Following Directions*
Concern for how well students can follow specific directions given for a certain task. Includes such things as not letting students search on their own or go off on uncharted areas of the web. Their concern is that students will get lost or access inappropriate material.

Sub-Category4. Lower-level Cognitive Thought
Concern with students' cognitive thought typified by simple recall of information, work with information that is readily at hand, and the changing of the form of information without changing its meaning (the lowest two levels of Bloom's Cognitive Taxonomy). Includes such thoughtful actions as locating specific information in a book, learning specific information, and reading from and comprehending text.

Broader Purposes - Those related to the Development of Independent, Creative and Self-Regulated Learners

Sub-Category 5. Higher-Level Cognitive Thought
Concern with students' cognitive thought typified by more complex manipulation and use of information (the higher levels of Bloom's Cognitive Taxonomy). Includes determining whether a particular piece of information supports a particular statement, analysis of information into its component parts, creation of new ideas such as hypotheses, and evaluation of the truth or falsity of ideas.

Sub-Category 6. Affective Thought
Concern with students' thought related to attitudes and values, whether found currently in students or the purpose of educational activities. Affective thought may be expressed in relation to either of two types of concerns.

Pupil Affective Dispositions. A concern with the agency of the individual student, i.e., is he or she willing to engage in the learning activity? This is a volitional

concern at the individual level. Includes such behaviors as enjoying or taking pride in participation and being excited about learning.
Conditions that Reflect or Even Promote Affective Thought. A concern with the affective condition of a student or students. This may effect the larger environment in which students work and its promotion of affective thought. Includes the teacher's assumption of a supportive attitude, a comfortable rapport between the teacher and students and students feeling reassured that participation will be accepted.

Sub-Category 7. Development of Learner Autonomy.
A concern with the development of student's ability and inclination to proceed independently in a learning task. Includes appropriate self-concept (self-esteem), self-monitoring skills and a feeling of efficacy (self-empowerment).

Other Pupil -Oriented Purposes

Sub-Category 8. Other
Student behaviors that do not fit into the above six categories.

II. Teacher Oriented Purposes

Sub-Category 9. Teacher Behavior
Any reference that focuses on the behavior of the teacher.

Categories of Purpose Statements: from Copeland & D'Emidio-Caston (1998)

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